An Address
ON
ANCIENT HUMORISM AND MODERN HUMORISM.

Delivered at the International Congress of Physiology held in Vienna, September 27th to 30th.

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I.

When, after an interval of three years, our family of physiologists finds itself once more gathered together in formal congress, as we are at the present moment, we have many things to say to each other, and as the intensity of physiological research is considerable, it will be necessary to mention the definite progress that has been made after three years of labour. At this, our first meeting, therefore, it would be fitting that the new facts discovered by physiologists should be set before you. When, therefore, our illustrious President did me the great honour—an honour for which I am profoundly grateful to him—of selecting me as the first speaker, I first thought of giving you a brief account of the work accomplished since 1907. But very quickly I realized that such an account, even if I were capable of giving it, which is very doubtful, would be more like an analytical review than an academic discourse, and would be more of the nature of a book than of a speech.

Therefore I thought it wiser, though equally rash, to furnish, instead of a technical and bibliographical analysis, a more synthetic study—a general sketch of the tendencies of contemporary physiology.

II.

Just as the traveller in the course of his journey, after having accomplished a fairly long stage, stops for a moment to look backwards and forwards, measuring with his eyes the distance he has covered and that which remains for him to traverse, so we, too, may ask ourselves what point we have reached and from what point we started: It is our right, our duty even, to seek in what direction is proceeding the evolution of the science which is dear to us—physiology—that science so useful in contributing to the welfare of mankind, to which all of us here present consecrate our teaching and our researches.

Now, it seems to me, upon reflection, that the physiological concepts of to-day might very well be expressed by a very old word, now perhaps a trifle out-of-date, "*humorism*." All of us at this present moment are, consciously or unconsciously, humoralists—that is to say, we look upon the chemical constitution of our humours as being the basis of all biological phenomena; and we understand that word "humour" in the most general sense, for we not only think of the circulating or secreted humours, such as the blood, the bile, the milk, the urine, and the gastric juice, but also of the liquids which enter into the composition of our tissues; in other words, of all the chemical substances in solution of which the living organism is composed. It is by the chemical evolution of the substances contained in the plasmatic liquids that life is constituted.

And in conceiving life under this form we are only following a very ancient tradition. From the earliest times the composition of the humours has been regarded as of fundamental importance. Humorism had preoccupied not only physiologists, but also, and especially, physicians. For physicians have always been a little more theorists than physiologists, though the theories of medicine are always the direct outcome of physiological opinion. At all times, and perhaps more than ever to-day, physicians seek both their theory and their practice in the teaching of physiology. It matters little whether they acknowledge this or not; they follow the impulse that experimentation gives to the biological sciences. We are the creators, the innovators, the revolutionaries, and they conform to our conceptions. So much better if these conceptions are right. So much the worse if they are wrong. Medical theories are always the reflection of contemporary physiological theories.

It is not surprising, therefore, that the word "humorism" applies as much to medical as to physiological ideas. The physicians of the past were humoralists because the physiologists were so also. And as the physiology of the present day is essentially humoralist, modern medicine is necessarily so too, even at the risk of exaggeration. Medicine and physiology are merged in one another. Hippocrates, Galen, Van Helmont, the masters of humorism, did not think it necessary to separate the theories of life from the theories of disease.

And we must follow their example energetically, resolutely. There are not two biologies, that of the sick man and that of the healthy man. The laws are the same. We have a right to claim all the admirable work of contemporary experimental pathology as a part of physiology. I know very well that experimental pathology and physiology are taught from different chairs. But we admit that that fact is not of the least importance. The method is the same; the object is the same. The method, everywhere and always, is the experimental method; the object is, everywhere and always, the knowledge of biological phenomena.

III.

The humorism of the ancients is very singular. According to Hippocrates, and—but for some slight shades of difference—according to Galen, life depends upon the humours. When they are in the right condition we have health; when they are corrupted we have illness. Nothing, you see, can be simpler.

What are these humours? Strange to say, Hippocrates, Galen, and all the physicians who followed them during sixteen centuries, describe humours which they had never seen, and which no one will ever see, for they do not exist. There was the blood, the yellow bile, the black bile, and the phlegm. The blood and bile have certainly an actual existence; but where is the black bile, which causes melancholy? And this extraordinary phlegm or pituitary secretion—this strange liquid, which is the cause of tumours, of chlorosis, of rheumatism, and cacochymia—where is it? Who will ever see it? Who has ever seen it? What can we say of this fanciful classification of humours into four groups, of which two are absolutely imaginary?

It was not until the advent of the great anatomists of the sixteenth century that the science of life emerged from the clouds in which it was enwrapped; it was not until the time of Harvey and Descartes that experiment triumphed over book learning. But what is truly extraordinary, what surpasses our wildest dreams, is the fact that for sixteen hundred years all physicians and all physiologists remained bound in the shackles of this incomprehensible error of the four cardinal humours. By what miracle was the spirit of conservatism or of routine able to hide the truth to such a degree? The men of science and the doctors of former times were no less intelligent than those of to-day. Nevertheless they accepted without a shadow of proof these childish theories; they could not see most simple facts, and they saw most complicated things which not only did not exist but which were not even probable. Is there not reason to be a little uneasy as to the fate reserved for our own work? Have we any assurance that our own conceptions will not be treated with contempt by our successors four hundred years hence? It is, therefore, prudent not to be too hard upon the past, because thus we may predispose those who come after us to show us a little indulgence.

With the Italian anatomists of the Renaissance, the orientation of physiology changed, in spite of the impotent efforts of Van Helmont; humorism was replaced by mechanism. It was thought that anatomy should be the guide of its servant, physiology. The dissection and opening of corpses became the basis of medicine and physiology. With the coming of Willis, Winslow, Morgagni, humorism was almost abandoned. And, after all, this was but just. How could it have any appearance of truth, since chemistry was not yet born?

It came into being, as you know, with Lavoisier, and with chemistry came medicine and physiology. The more I study the history of physiology the more do I look upon Lavoisier as the great initiator. It is useless to describe here his immense work. I will content myself with

indicating it in a sentence that sums it up. Lavoisier understood, discovered, and demonstrated that life is a chemical phenomenon. At once all was clear. One understands the cause of animal heat, the *raison d'être* of respiration and alimentation; one grasps the meaning of energy; one applies the great principle of the transformation of the forces to general biology; and one can plainly foresee that humorism will triumph, and that the chemical transformations of which the organisms are the seat will be merged in the vital principle, which itself will have become superfluous. In spite of Galen, Descartes, Harvey, Haller, physiology begins with Lavoisier.

IV.

Nevertheless, the great scientific revolution which gave birth to chemistry did not immediately bear fruit. There were periods of uncertainty and hesitation, during which physiology and medicine, its faithful companion throughout the glorious nineteenth century, so fertile in discoveries, have oscillated, not knowing exactly from what side light was to come. And, in fact, just as the anatomists of the Renaissance guided biology from the side of dissection, so the micrographers, with their more and more perfected microscopes, have appeared to draw physiology towards histology, histogenesis and cellular morphology. Now, even if magnificent discoveries have been made as to the structure of cells; if it has been found possible to describe their forms, and the transformations of their granules; if, finally, it has become possible to consider the cell, which appears so simple an element, as an extremely complicated world in itself, nevertheless it seems to me that all this progress in morphology has done nothing towards elucidating questions of physiology. The greatest physiologists, on various occasions, have laid stress on the inadequacy of anatomy—even the most delicate microscopic anatomy—to elucidate the modality of the functions. This was one of the ideas dear to Magendie, and especially to Claude Bernard, who never tired of repeating that histology can do nothing, or next to nothing, for physiology, and that the knowledge of a form in nowise implies the knowledge of a function. It seems to me that one cannot possibly exaggerate in this direction. Even if we are able to describe minutely the form of a cell and the complicated network of the different granules which constitute it, we shall not have got much further towards knowing its proper function. Granted that a nerve cell contains two or three groups of matter which will take a different stain, how does the knowledge of that fact help us to know the quantity of oxygen it consumes, to determinethe conditions of reflex action and the laws of its irritability? Let us suppose that we have fathomed the structure of the muscular fibre, what will it teach us of muscular contraction?

Happily physiologists have not allowed themselves to be misled by the mirage of the microscope; they have studied physiology as physiologists, not as histologists; by chemical and physical experimentation, not by morphology. It is evident that neither Claude Bernard, Helmholtz, nor Ludwig refused to admit the use of it; but they always declared that its use was limited. They always preferred experiment to observation. They always preferred to analyse a function rather than to describe a form. It is for this reason that they made such noble discoveries, for the histology of an organ does not by itself lead to the discovery of the function of that organ.

V.

But medicine has not been as wise as physiology. It believed that microscopic anatomy, normal or pathological, was going to clear up everything, and we are forced to admit that it has hardly derived any profit at all therefrom. The whole history of cellular pathology, despite the genius of Virchow, has ended in a rather lamentable failure. Two or three of Pasteur's experiments have done more towards the renovation of medicine than fifty years of pathological anatomy.

And if I speak of Pasteur, of his glorious successors, R. Koch and Ehrlich, as I might speak of the eminent bacteriologists of the present day, it is because experimental pathology becomes mingled with pathological physiology, though not with morbid anatomy. It is not the microscopic observation of forms that has given us these marvellous discoveries by means of which the medicine of the past has been completely overthrown. Every branch of medicine has been regenerated—etiology, pathogeny, hygiene, therapeutics. It has been a revolution without precedent in the history of science. And this progress is due solely to experimentation—that is to say, to the methods of the physiologists. The morphology of bacteria is of little importance compared with the biology of bacteria.

Nevertheless, at the beginning of bacteriology, it seemed as though there was to be a definitive movement away from humorism. But important discoveries very quickly showed that, even for the study of microbes, it was necessary for the application of phenomena to come back to biologico-chemical analysis—that is to say, to humorism—for the understanding of microbes.

First came the fine discovery of Roux, which proved that the symptoms produced by the living and developing microbes are more or less identical with the symptoms caused by chemical substances which contain microbes. By injecting the soluble products contained in the microbes of diphtheria, the symptoms of that disease, which is due to the multiplication of diphtherial microbes, are reproduced. Some time afterwards I showed, in conjunction with Héricourt, that there are in the blood chemical substances capable of producing immunity. This was the principle of serumtherapy, which was so brilliantly applied by Behring two years later to diphtheria. And on all sides, with admirable enthusiasm, both doctors and physiologists, without stopping to ask if their work belonged to the domain of medicine or to that of physiology, studied the chemical functions of the blood, and have discovered in it manifold properties, the complexity of which increases every day. This is humorism in the strictest sense of the word.

You see, therefore, that although physiology has from the beginning been attached to humorism, medicine oscillated for a long time between contrary tendencies, leaning turn by turn towards anatomy, histology and bacterial morphology, but finally reverting to humorism, following the way pointed by the physiologists.

VI.

It is hardly necessary to point out that this modern humorism differs profoundly from the humorism of the ancients. In order to make you better understand the abyss which divides contemporary science from the conceptions of the past, I should like to show you in a very simple form—which I will try to present under the form of laws—the principal data of the humorism of to-day. To tell the truth, I reproach myself a little for using so pretentious a word as "laws." They are not laws, but rather generalizations of facts. It is no longer, as in the days of Hippocrates and Galen, a question of more or less undemonstrable theories, but rather positive facts, demonstrated and incontestable.

The first law is the following; it is founded on an incalculable number of facts:

The quantities of substances which come into play in physiological reactions are often in such minute proportions that they may be called imponderable.

This, first of all, calls for a definition of that which is ponderable. The limit of it is shown by the delicacy of our balances. One can weigh with a certain degree of exactitude a tenth part of a milligram, though that itself is a sufficiently delicate measure; but further we cannot go, and when we have to do with a hundredth part of a milligram, we have no means of determining such a weight. All the same, we are able to speak of a hundredth part, a thousandth part, a millionth part of a milligram; because, by dissolving a milligram in a litre, we get a thousandth part of a milligram in a cubic centimetre; by dissolving it in a cubic metre, we get the millionth part of a milligram in a cubic centimetre. But no chemical reagent, however sensitive, can reveal the presence of this infinitely minute amount. Nevertheless, certain physiological reactions allow us to demonstrate the action of these prodigiously diluted substances. I will give you some examples.

VII.

In seeking to discover the action of metallic salts on the acid fermentation of milk—a transformation of lactose into lactic acid—I have been able, by the use of very delicate acidimetric processes, to measure very minute

differences between the quantities of acid contained in the fermented liquids. For example, I have been able to determine that in certain milks the quantity of acid was 100, and in others 100.5. This slight difference would signify nothing if one were content with analysing two flasks: the Flask A has 100, the Flask B 100.5. Manifold influences, impossible to determine with exactitude, may easily have slightly accelerated the process of fermentation in the flask of which the acidity is 100.5. But if, instead of using only two flasks, I use 2,000—1,000 flasks of Milk A and 1,000 flasks of Milk B—and if I find almost invariably that there is a difference of 0.5 per cent. between Milk A and Milk B, I am warranted in concluding with absolute certainty that there is in the flasks containing the Milk B an influence which is not negligible, and which accelerates the fermentation.

It is in this way that I have been able to establish that sometimes quantities of metallic salts corresponding to the frightfully small dose of the ten-millionth of a milligram per litre (in the case of the vanadium salts, for instance), were not without some effect on the lactic fermentation. This figure is altogether extraordinary, for the ten-millionth of a milligram exceeds in infinity all that we are accustomed to take into consideration.

Nevertheless the lactic ferment is discernible, distinctly discernible, in this amazing dilution, and as there is in a litre which is fermenting a hundred thousand milliards of cells, and perhaps more, it follows that the quantity of vanadium which acts on each cell is indicated by a fraction of a gram so small that twenty-five zeros would be needed to express it. All metals act almost in the same way as vanadium, notably thallium and barium. One may, therefore, ask oneself if it is a case of chemical action or of an action more or less analogous to that of radium. My lamented friend P. Curie formerly gave me a little radium emanation, that is to say, a gas in such small proportion that it is imponderable (one is not even yet certain that this emanation is a gas); in any case it has been possible to mix this emanation, already greatly diluted when Curie gave it to me, with 1,000 times its volume of air without its ceasing to exert an action on the lactic ferment. There is, therefore, ground for asking oneself if this action of the diluted metallic salts, that of the emanation of radium, to which the action of mineral waters is now compared, is chemical or physical? Is there not a transformation of energy? When the chemical action is transformed into other energies it becomes in certain cases perceptible to our senses even when it is very slight. Thus the light of a bright acetylene flame during one second represents only 1 cg. of carbon; nevertheless, it is perceived at the distance of 1 kilometre, that is to say, over an area of a square centimetre, making part of a sphere the radius of which is 1 kilometre. The very minute quantity of luminous energy set free by the thousand-millionth part of a milligram of carbon is still perceived by our retina.

In truth nothing permits us to suppose that these phenomena are not chemical; for we do not know the limit of the sensitiveness of living cells to chemical action. All that we can say is that the cells are extremely sensitive to chemical excitations. I can give you some examples of this.

It cannot be supposed that the olfactory sensibility is due to an excitation which is not chemical in nature. An odour is perceived when some particles of material substance come in contact with the olfactory mucous membrane, and this contact is necessary. But what infinite smallness! How calculate the quantity of matter that a hare leaves behind it in crossing a field? Nevertheless, it is enough to enable a dog to find the scent two hours later. Berthelot proved that in making a sufficiently rapid current of air pass over iodoform the smell of the iodoform is very distinctly perceived in the air that has passed. Nevertheless, the weight of the iodoform remains almost the same, although its smell is perceived in each one of the millions of litres that have been in contact with it. Berthelot was accustomed to cite another fact of the same order, but of rather uncertain interpretation. When one rubs copper lightly a certain characteristic odour is liberated, and yet the copper does not lose in weight.

M. Engelmann made a very curious experiment. Certain infusoria contain in their cell some granules of chlorophyll. Now if these infusoria are made to live in a liquid containing bacteria, and they are exposed for only a second to a ray of the sun, at once all the bacteria are seen precipitating themselves towards the chlorophyllian infusorium. This is because the infinitesimal quantity of chlorophyll exposed to light during a second has decomposed a particle of the dissolved carbonic acid and liberated oxygen which attracts bacteria. And, of course, in such a case we have to do with an imponderable quantity. But this quantity has been sufficient to make the bacteria precipitate themselves with violence towards this thousand-millionth part of a gram and a still smaller quantity of oxygen that has been given off.

The quantities of iodine found in the blood are in such small quantity that they cannot be measured. Often even one cannot detect any trace, and nevertheless, this iodine, which is found in imponderable proportions in the blood, may be—perhaps by the thyroid body—separated, isolated, accumulated, so that there is an iodine combination in the gland.

And as regards adrenalin secreted by the suprarenal glands and certainly poured into the blood, in what infinitesimal doses is it found in the blood of the suprarenal veins!

All chemiotaxis reveals to us the action of infinitesimal quantities. And in this chemiotaxis the history of the spermatozoa is of quite special interest. If they are attracted towards the ovum, that is assuredly by a chemiotactic force, and direct experiment proves that they are extremely sensitive to the weakest chemical action. If they are placed in contact with a drop of acid diluted to one-thousandth they are at once attracted. Now they move only because there is a difference of acidity between the quantity of acid found in the head and that in the tail of the spermatozoon; and this difference, if one thinks of the smallness of the cellular organism, exceeds in minuteness all that we can imagine.

In passing, it may be mentioned that embryology, which had hitherto remained a science almost entirely morphological, in which it might seem that humorism played no part, has now also entered on its humoral period. And forthwith great results have been obtained. The admirable researches of Delage have established the fact of chemical parthenogenesis, and the chemical—or osmotic, which is almost the same thing—influence of certain metallic salts even greatly diluted on the maturation of the ovum. So that chemistry—that is to say, humorism—dominates the penetration of the spermatozoon into the ovum, due to chemiotactic affinities as well as the maturation of the ovum and its embryogenic development. The chemical laws which govern the life of the adult also govern his birth. Certainly one is astonished when one sees a single cell by its proliferation become the origin of the immense aggregation of diverse cells which makes up the adult. But astonishment is still greater if one reflects that this development is the result of a chemical conflict, a conflict of substances altogether specific—since fecundation does not occur between different species—substances the absolute quantity of which is so small that it exceeds the limits of our understanding.

Experimentation with toxins furnishes us with examples just as remarkable.

Allow me in connexion with this to speak to you of a fact which I discovered some years ago, and which I called *anaphylaxis*. Thanks to the ardour and talent with which on all sides this new law of general physiology has been studied, it has assumed a great importance in physiology, and especially in pathology.

Anaphylaxis is the opposite of protection (phylaxis). If one injects an albuminoid substance—for example, a toxin—into the circulatory system of an animal, instead of being protected by this first injection against a further injection of the same toxin, it has become more sensitive to its action. Let us suppose that the fatal dose is 1 cg. The injection of a tenth part of that dose—that is to say, 1 mg.—will not make it at all ill, or scarcely so. But a month later—for almost a month is required for the anaphylactic state to be produced—it has become so sensitive that a dose of 1 mg. is enough to kill it by the immediate production of formidable symptoms. Therefore the first injection has caused a condition which is the opposite of protection—namely, anaphylaxis.

The sensibility of certain animals, notably guinea-pigs, to this first injection, which produces the anaphy-

lactic condition, is altogether extraordinary. Two American physiologists, Rosenau and Anderson, have made a curious experiment on this point. They inject guinea-pigs with a very inoffensive serum, namely, horse serum; and they have satisfied themselves that horse serum has sometimes an anaphylactic effect in the inconceivably small dose of one-hundred-thousandth part of a cubic centimetre. In other words, a guinea-pig which a month before received the hundred-thousandth part of a cubic centimetre of horse serum, is never again altogether the same as a normal guinea-pig. If at the end of a month it receives another injection of a dose of horse serum, perfectly harmless to a normal guinea-pig, this will kill it in a few minutes. Now, the chemical albuminoid substance in horse serum which produces anaphylaxis is probably in very small proportion; it perhaps contains only one-thousandth part of the active substance, perhaps even less; in any case we learn from this curious experiment that a thousand-millionth part of a gram is still an active—a very active—quantity.

Another American physiologist, Dr. Vaughan, has succeeded in extracting from ovalbumin a chemical substance, both albuminoid and crystallizable, which produces anaphylaxis when given in a dose of a thousand-millionth part of a gram.

Anaphylaxis is not the only way in which the influence of these infinitesimal quantities of substance is manifested. The history of haemolysis, which the splendid work of Hamburger, Bordet, and many others has made so precise, shows very clearly that the most minute proportions of certain definite chemical matters possess a powerful activity.

The injection of a toxin produces an antitoxin (the active substance of anaphylaxis), and these antibodies and toxogenins are almost absolutely specific. But this is not the most curious feature of their history. To every antigen there is a corresponding special antibody. To the diversity of antigens correspond the diversity of antibodies secreted. The tyrosine of vegetable origin and the tyrosine of animal origin appear identical, and yet, as my friend C. Gessard has shown, vegetable antityrosinase is not the same thing as animal antityrosinase. Nothing can give us a clearer idea of this rigorous specificity than the application of anaphylaxis to medico-legal research.

M. Uhlenhuth has made some very conclusive experiments on this subject. Nine guinea-pigs receive injections of some drops of blood, of unknown origin (man, dog, rabbit, ox, horse, sheep, tortoise, fowl, or guinea-pig). A month later each of these guinea-pigs receives an injection of serum (man, dog, or rabbit, etc.). Let us suppose that one animal dies, the one injected with the blood of a horse. From this we may conclude with absolute certainty that the blood of unknown origin which was injected into the guinea-pigs a month earlier was that of a horse.

In connexion with this subject a somewhat amusing experiment has been made. A watery extract of various tissues from an Egyptian mummy over 3,000 years old was made and injected into guinea-pigs, and a month later it was found that these animals had been made anaphylactic by means of human albumins; which justifies us in drawing the conclusion—otherwise very probable—that the chemical constitution of the human being 3,000 years ago closely resembled the chemical constitution of man to-day.

I could cite many other facts, but I think I have said enough to convince you that very small quantities of substance possess a considerable biological activity. I prefer to try to indicate to you what deductions are to be made from such cases.

To begin with, our method of study is different from the old methods.

Up to the present, if one wished to study a substance one determined it chemically, one endeavoured to isolate it, to prepare it in a state of relative purity. But nowadays a new biological chemistry has sprung into being, that of imponderables. The *Chemistry of Imponderables!* These are two words which seem terribly contradictory. For chemistry depends above everything on the balance, and here we are constrained to study bodies beyond the reach of the balance.

The chemistry of the imponderables becomes necessarily, therefore, the chemistry of functions, in quite a different sense from the chemistry of functions in organic chemistry. It is the chemistry of the biological functions of the humours.

Assuredly there is a certain amount of danger in studying bodies that one cannot isolate, in giving them names, in describing their properties without having seen them, without having isolated them in the slightest degree, knowing on the contrary, that they are mixed together with a great number of similar bodies. This is a real danger which must be taken into account—all the more because we have seen Hippocrates, Galen, and the old masters of medicine describe humours which existed only in their imaginations! Nevertheless, here we are dealing not with hypotheses, but with positive experiments. Here, let us say, we have a cubic centimetre of serum containing, besides the normal substances of serum, an anticoagulating substance, an anaphylactizing substance, or toxogenin, a lipase, a glycase, an antihaemolytic substance, a diphtherial antitoxin, a tetanus antitoxin, and if the unfortunate animal from which the serum is to be taken is capable of resisting other injections of antigens, its serum may contain many other antibodies besides. It would be an utter impossibility to isolate these different substances, the properties of which are very similar, though certainly not identical. Let us content ourselves by studying the chemico-biological functions of this drop of blood, which is a world in itself, and which possesses very strongly-marked properties—properties that a sagacious and scientific experimentation is going to reveal to us.

We are as yet only at the beginning of this chemistry of imponderables founded upon the analysis of biological functions, and nevertheless we can already foresee several of its consequences. It leads us directly into a region which up to the present day was almost totally unexplored—that is to say, into the physiology of the individual.

Till to-day investigators have concerned themselves almost entirely with the physiology of the species. One endeavoured to learn the conditions of existence of rabbits, dogs, cats, and guinea-pigs, and it was believed that the different individuals of the same species were identically the same, which is, in truth, very nearly the case. What is true of one rabbit would be applicable to another rabbit of the same size, sex, nourishment, and colour. But, as a matter of fact, such identity does not exist. In the vast forest there are no two families identically alike. No two animals are ever identical. It is certain that there are between them both anatomical and functional differences. Therefore it would be most interesting to physiologists to go further than they have yet done to determine these different characters; in a word, to work at the physiology of the individual after having studied the physiology of the species. To determine in what degree the individuals of the same species differ from each other would decidedly be a most useful and fertile discovery for physiology as well as for medicine.

Individuals of the same species differ in their psychological characteristics. This fact does not surprise us, since it has been a matter of common knowledge for a long time. The differences are all the greater the higher we go in the scale of mental development. In the human race the psychological differentiations which give to each individual a special character are most strongly marked. Each of us has a personality which differs very sharply from every other human personality. Memory, which has fixed in each of us the recollection of dissimilar events, accentuates all the more this intellectual variety which exists in us from the hour of birth. We are not surprised at it, for from the first beginnings of thought we have understood that our own "ego" differed from the "ego" of others in character, will, tastes, feelings, and memories.

We have, therefore, every one of us, a psychological individuality. But what has not been sufficiently taken into account is that each of us has also a humoral individuality. Each of us is differentiated from the rest of mankind not only by our mentality but by our chemical constitution. Since our humours contain an enormous number of imponderable substances, similar and allied, which most certainly exist in different proportions in different individuals, it follows that the humoral differences can be no less than the psychological differences. The more one analyses the chemical functions of the blood in different individuals, men or animals, the more one finds

individual differences; and if, up to the present, homologous liquids belonging to animals of the same species have been identified, this is because it has only been possible to make an insufficient analysis.

Our chemical processes are too imperfect and too rough to reveal these differences to us. All the same we are able to affirm that they exist. The blood and humours of a person vaccinated ten years ago differ from the blood and humours of a non-vaccinated person. But will it ever be possible to isolate and determine this substance to which the vaccination has given birth in our organism?

Every illness, every intoxication, has caused the formation, perhaps the destruction, of a certain substance in the blood, and has left its natural trace, a trace which is not effaced by years. Just as there is the psychological memory, facts which are present to the consciousness, so there is a humoral memory of all preceding injections. As these injections differ in each person in intensity, quantity, and duration, it follows that each person differs from every other in the chemical properties of his blood.

It is useless to object that these differences are due, not to substances dissolved in the blood, but to leucocytes, and that it is by the modality of phagocytosis that individuals differ. According to the latest analysis, phagocytosis is a chemical phenomenon. The leucocytes have no activity save through the ferments they secrete, so that the differences of the phagocytes can be nothing else but a difference in chemical composition.

One might have hoped to discover a means of recognizing the individual humoral differences through the study of anaphylaxis. I have endeavoured to do so, but without success. This is how I proceeded. At first I tried to see how far it would be possible to transfuse the blood of one animal into another of the same species, and I found that one could inject into a dog 10 per cent. of his weight of pure dog's blood. A month later I injected the same dog with another 10 per cent. of blood taken from the animal from which the blood had before been transfused.

If there had been an individual anaphylaxis, there would have been at the second injection symptoms to which the first injection had not given rise; as if, for example, instead of two injections of dog's blood, I had given two of horse's blood. But the result of these experiments has been on the whole negative.

This by no means invalidates the fact of a strongly-marked humoral individuality, for anaphylaxis, notwithstanding all its precision, is still, like the rest, a somewhat rough process.

To sum up, as far as the law which is called the first law of humoralism is concerned, we can state positively that there exist in our humours innumerable substances, in infinitesimal and imponderable quantities, which, in spite of their minute proportion, play a considerable part in biological phenomena; and that, being in different proportions in each person, give to the humours of every individual a personal character, which differentiates him from all the other individuals of his own species.

We are, therefore, thoroughgoing humoralists; so much so that we can hardly suppose that the action of these infinitesimal quantities is exercised by the phenomena of ionization or osmosis. Whatever may be the importance of osmosis, it does not make itself felt when we have to do with the millionth part of a gram. It is certain that the mode in which these substances react is chemical, though we know little about the way in which chemical reactions operate in fairly strong dilutions.

Nevertheless we can foresee the modalities according to which these reactions of imponderable substances are effected. Certain remarkable and established facts relative to the function of certain glands, notably the pancreas, permit us to do so. The pancreatic trypsin has no digestive power; and as a matter of fact is it conceivable that there exists in a cell a substance which digests the cell itself? The pancreatic juice, isolated and gathered with minute precautions to guard against admixture with other liquids, is therefore deprived of all digestive activity, and the pancreatic cells contain no ferment. But they contain a "proferment," a pro trypsin, which can become extremely active under the influence of diverse chemical actions, and notably that of intestinal enterokinase. The active chemical substance A is therefore preceded by an inactive substance A', which is its generator; and A' becomes A when it is in presence of another substance B' equally inactive. There will then be the following reaction, which is really very simple: $A' + B' = A + B$. It is probable that the quantities B' necessary to bring about the reaction are very small, and it is possible that B' does not disappear in this reaction. It is of little consequence; none the less, the matter stands as follows:

The activity of a liquid results from the conflict of two substances which, isolated, are inactive.

This is the second law of humorism, to which I call your attention most particularly, for it is of very wide scope. The haemolytic phenomena are due to the action of two substances, the properties of which it has been possible to study separately. The phenomena of anaphylaxis are likewise due to the combined action of two substances which are powerless when apart—namely, the antigen, which is in itself in a small dose ineffective, and the toxogenin which exists in the blood of an anaphylactized animal, toxogenin the slow formation of which has been caused by the injection of antigen; toxogenin which is in itself absolutely ineffectual and non-toxic, since anaphylactized animals live for a long time in perfect health; toxogenin which becomes a terribly deadly poison in the course of a few seconds when it meets with antigen, which likewise, in itself, is inoffensive.

Moreover, we find a striking example of these combined actions in an experiment well known to all physiologists since Claude Bernard. Amygdalin, from bitter almonds, is an innocent enough substance, as is also the emulsion, which is not at all poisonous. Now, if an animal is injected with a very small quantity of emulsion, having previously received an injection of amygdalin, immediate and appalling symptoms appear, for the result of the chemical conflict of amygdalin and emulsion, both harmless, is a terrible poison (hydrocyanic acid). Every time that a careful experiment has been made on ferments and toxalbumins, so nearly allied to the ferments, it has been ascertained that in the organisms ferments and toxins exist in the state of *proferments* and *protoxins*. The cell can only secrete a substance inoffensive for the cell; it would be absurd to suppose that it will produce that which is capable of killing or dissolving it. Therefore it secretes only a harmless substance, endowed with scarcely any toxic or fermentative properties. But this innocent substance, which is neither haemolytic, nor glycolytic, nor lipolytic, nor neurolytic, may become so when it encounters in its path another equally harmless substance. And the result of the reaction will be, according to the nature of the two bodies which come into play, or even of one of these bodies, the production of a substance either haemolytic, glycolytic, lipolytic, or neurolytic.

If most often we act upon ferments and toxins already formed, it is because we have not known how to prepare the protoxins and proferments. As a matter of fact, these preparatory bodies are probably of extreme instability, and transform themselves into real toxins and real ferments under very slight chemical influences, weaker than our laboratory reagents, which are violent and brutal, and whose action is not controlled. Thus, in order to arrive at a knowledge of these proferments we are nearly always obliged to study the organic liquids intact without having subjected them to any manipulations. The preparation and isolation of these bodies causes them to disappear, and the more one tries to purify them so much the faster do they disappear, as of old gold disappeared in the crucible of the alchemists.

We were speaking just now of the chemistry of the imponderables; now we have come to the chemistry of unstables. And certainly the difficulties are immense, but it is the interest of science that every step in advance leads us into a region the exploration of which is more laborious and more uncertain. Let us give this instability of chemical substances, humoral or biovular, its real name, its true physiological name—it is irritability. To be unstable is to be apt to modify one's self under the influence of the feeblest external actions; it is to be irritable by exterior actions, whether mechanical, physical, or chemical; all irritability—that is to say, the greater part of physiology—has for its basis the chemical instability of bodies which constitute the living being.

Thus, on the one hand, a substance is active, though the

proportion of it is small; on the other hand, for the function of this substance, by the conflict of two substances which have been prepared long before, a very slight excitement, chemical or other, suffices. These two laws lead necessarily to a third, namely, that phenomena of great intensity may be produced suddenly, when a chemical cause, even a very slight one, intervenes. This chemical cause, which though infinitely minute leads to sudden and powerful effects, is produced by the nervous system. It is probably in this way that is to be explained that wonderful phenomenon which has justly attracted the attention of all physiologists—the action of the nervous system on the secretions. One of the masters of physiology, the great Pflüger, whose recent death we now deplore, a long time ago sought to discover nerve endings penetrating into secreting cells. This is not necessary in order to understand the phenomena of glandular excitement. We need not suppose that the nervous protoplasm comes into direct contact with the glandular protoplasm. It is sufficient to admit that a most minute fermentative reaction is produced from the beginning of the nervous tube to its ending, running along from point to point like a train of gunpowder, with a rapidity of 30 metres a second, and that at the extremity there appears a minute quantity of substance which is capable of acting chemically upon the secreting cells. The imponderability and the instability of the chemical substances of our organs are sufficient to explain this action. And perhaps it is by an analogous mechanism that the nerves act upon the muscles and determine reaction. Who knows even if the complicated actions of the soul, reflex or voluntary, the feelings and the emotions, are not also chemical phenomena, as Lavoisier has already remarked in words that have become famous. But I do not wish to allow myself to be carried away by hypotheses; it is enough for me to have established that the irritability of our tissues is the necessary and inevitable consequence of the two fundamental laws of humoralism—imponderability and instability. You see, therefore, that there is no need to place in opposition to each other the humoral and the nervous theories, inasmuch as the irritability which rules the functions of the nervous system is in itself a humoral phenomenon. And, by a wonderful concatenation, the nervous system acts at every moment on the chemical constitution of our humours, just as the chemical constitution of our humours reacts each instant on the nervous system. But in the case of the nerves, as in the case of the humours, it is chemistry that governs all. The living being is a chemical mechanism, and perhaps it is nothing more.

In any case its completion is astounding, and we might well be afraid, if we had not before us the example of our glorious predecessors. With resources very inferior to ours, with imperfect instruments, obsessed by ridiculous theories, they finished by bringing to light some truths from the ocean of darkness in which they were sunk. It is true that they were not always modest, and they often believed themselves to have grasped the truth when they had only got hold of illusion and error. There also let their example serve us as a lesson. Let us be bold in hypothesis. One is never sufficiently so. But let us also be very cautious in affirmation. For that which constitutes a true man of science is that he joins to extreme boldness in hypothesis extreme caution in conclusion. Especially, do not allow your patience to tire. Nature is rebellious, and does not allow the first comer all at once to tear from her her secrets. One only succeeds in learning these terrible secrets in fragments, and at the cost of long and laborious efforts. There is no need for me, gentlemen, to recall this to you who have disinterestedly given yourselves to the study of the great problems of life. It is not, therefore, to you that I speak, but I will speak all the same, for I should wish that my feeble voice could be heard louder and further.

Science to-day cannot progress without great pecuniary sacrifice. Science is costly. Instruments and laboratories, staffs and material—the expense increases every day with the increase of the difficulties of research. It is therefore necessary that public authorities and public opinion, which is superior to governments, should at last understand that physiology must be supplied with necessary arms. But, alas! it is other arms that are gathered on all sides. Never has the madness of militarism been so serious. All the energy that there is in peoples—energy in men and energy in money—is devoted to the fostering of absurd hatred and fratricidal rivalries. War—the war which ruins and desolates mankind—war takes all. And science—beneficent and fertile science—science has only the remains. Incredible and lamentable error, which at all times weighs on human destiny, and to-day more heavily than ever.

Do you wish for a striking example? Here it is. An admirable discovery has just been made. Man has just succeeded in constructing flying machines and in supporting himself in the air, in traversing space as rapidly and easily as a bird. We have some right here, gentlemen, to be proud, since it is the physiologists who opened the way for the brothers Wright. I can speak of it here before you, Mr. President, who have made such beautiful investigations on the flight of birds. And why should I not recall the memory of a great physiologist, my master Marey, who, with his profound sagacity, foresaw the triumph of the airman? And why should I not say—not, I admit, without some pride—that with my ingenious friend Zatin, in 1892, we constructed and floated the first aëroplane. Aviation, therefore, has its starting point in physiology, and it is well to record the fact here in a gathering of physiologists.

Well, poor man is brutalized by his warlike fury to such a point, that the conquest of the air by science and human industry has at once suggested to him the triumphant idea that the aëroplane is a marvellous engine of war. He has set before himself the glorious task of transforming an instrument of pacification into a murderous machine, and, excited by foolish journals, public opinion has become more violently warlike.

In the face of this immense human folly we, my dear colleagues, have a great duty. That is, to seek to dissipate ignorance, for it is by ignorance that men are made as bellicose as savages.

Let us combat ignorance and aid the coming of the kingdom of science, which knows no frontiers. Science makes existence happier and less cruel. It is entitled to the respect of all, for it prepares a less barbarous world for the men of the future.

Honour, therefore, to our science! Honour to physiology, which strives for the mitigation of the misery, the error, and the suffering of mankind!

ABSENCE OF THE FALLOPIAN TUBES AND OF MENSTRUATION.

MONTHLY RECURRING ATTACKS OF PERITONITIS: RELIEF FOLLOWING AN OPERATION JOINING OVARIAN POUCHES WITH THE UTERINE CAVITY.

BY W. G. SPENCER, M.S.,
SURGEON TO THE WESTMINSTER HOSPITAL,

With a Note

BY ALBAN DORAN, F.R.C.S.,
CONSULTING SURGEON TO THE SAMARITAN FREE HOSPITAL.

I AM much obliged to Mr. Alban Doran for his note on this case. He tells me that there is no similar case recorded in the *Transactions of the Obstetrical Society of London;* nor does there appear to be such a one included in the bibliography attached to Dr. J. W. Ballantyne's article in Allbutt and Eden's *System of Gynaecology*, second edition, 1906, p. 171; nor have I found any other reference.

History.

G. R., single, aged 28, a general servant, was sent into hospital in May, 1909, by Dr. Shillingford, of Peckham, complaining of attacks of pain in the right iliac region. The patient had never menstruated; she had never had a show of any kind. When aged about 18 she first felt sharp pains in the abdomen around the umbilicus, and such pains have recurred with fair regularity every month, usually lasting three or four days. Gradually the attacks of pain became more severe. They began by a strange feeling in the right iliac region; then, as the pain increased around the umbilicus, she felt faint, trembled, sweated, and had nausea. A very severe attack occurred in September, 1908, and another in the following November. Recently the umbilical pain had tended to spread

round to the back and downwards behind the left hip, the latter pain persisting between the attacks. The last occurrence was a week before admission. Her reason for going to Dr. Shillingford was that she was becoming unable to follow her occupation.

Examination after Admission.

She was a well-grown woman with normal breasts, external genitals, and hair. There was a well-defined normal hymen. Per rectum a normal movable uterus with cervix was felt. To the right side there was felt bimanually an oval swelling in the ileo-caecal region resting on the psoas muscle. It was thought to be an enlarged appendix, or an appendix adherent to an ovary, separated from the uterus by a normal broad ligament. On the left side there was a smaller swelling, which was taken to be a tender ovary, whilst the left broad ligament seemed free. No further abnormality was discovered.

Operation.

An incision was made through the right linea semilunaris, when the omentum was found adhering by its free margin over the fundus of the uterus and ovarian region (Fig. 1).

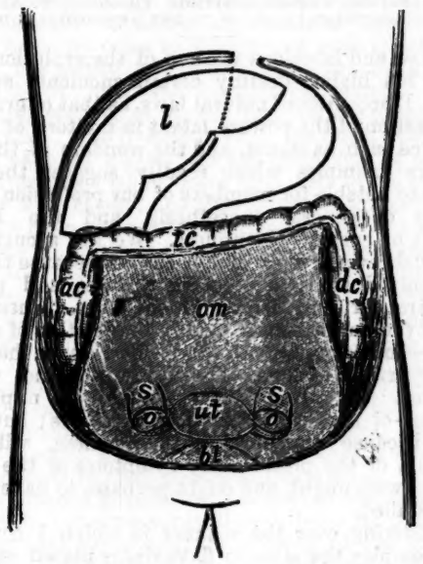

Fig. 1.—*l*, Liver. *ac*, Ascending colon. *tr*, Transverse colon. *dc*, Descending colon. *s*, Ovarian pouches. *om*, Omentum. *bl*, Bladder. *ut*, Uterus. *o*, Ovaries.

Having separated and reflected the omentum, a perfectly normal appendix was drawn out with the caecum, examined, and replaced.

Next the uterus was examined. The body was quite normal;

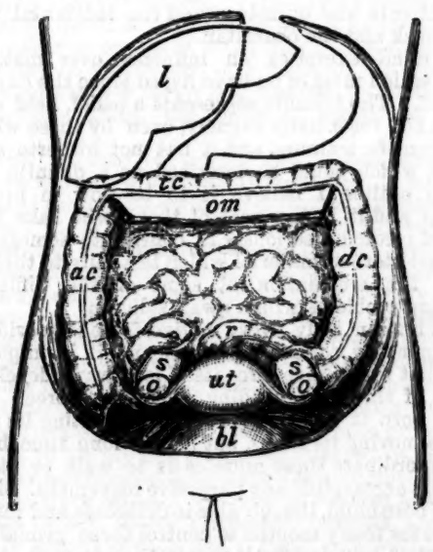

Fig. 2.—Lettering as Fig. 1. *r*, Rectum.

in the place of each cornu was a pea-like knob. There was no sign of the main portion of the Fallopian tube on either side, but the round ligament was well defined, and there was nothing else abnormal about the inner part of the broad ligament. Each ovary was enclosed in a pouch formed by peritoneal adhesions; the opening of the pouch into the general peritoneal cavity was directed backwards; the peritoneal surface of the ovaries projected into the interior of the pouches (Fig. 2). This surface of the ovary appeared normal, and on pricking one of the follicles fluid spurted out; but I did not observe any sign of a corpus luteum of menstruation, nor any remains of blood clot or pigment whatever.

In the wall of the sac where it was continuous with the broad ligament there appeared to be traces of the fimbriae of the Fallopian tube. I then went on to search for the Fallopian tubes. A uterine sound was passed quite easily by Dr. Bourns, and to the normal distance. I then laid open the uterine cavity by cutting transversely upon the point of the sound (Fig. 3), and tried to pass a fine probe outwards through the cornua. But the lumen of the uterus did not extend into the pea-like knobs previously noted. On the left side the knob contained a small dermoid cyst enclosing sebaceous material but no hairs. On the right the knob was a mass of fibrous tissue. I next slit outwards the upper free edge of the broad ligaments, and split the layers without finding any trace of a Fallopian tube, except

Fig. 3.

what appeared to be the fimbriated extremity fused in the wall of the ovarian pouches.

Next I passed a drainage tube downwards from the uterine cavity through the cervix, and brought the orifices of the two ovarian pouches over the uterus and sutured them so as to establish a continuity with the uterine cavity (Fig. 4). Over

Fig. 4.

this I laid and stitched in position an omental graft, by cutting away the reflected omentum from the transverse colon, the raw surface so left being infolded. Thus, only serous surfaces

remained, and all opportunity for the further formation of peritoneal adhesions was avoided (Fig. 5).

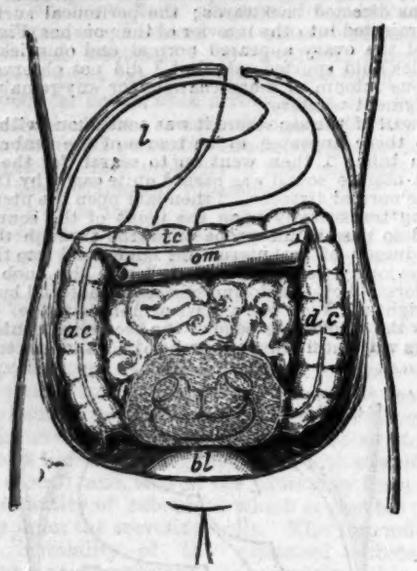

Fig. 5.

The abdominal wound was then sewn up in stages. There was a little blood-stained uterine discharge, which soon ceased after the uterine tube had come away, on the fourth day, from the vagina.

The patient has returned frequently for examination. She is in very good health, has had no further attacks nor abdominal disturbance of any kind nor any noticeable vaginal discharge.

Conclusion.

As for the operative procedure, it was commenced with the object of relieving the patient by removing the appendix. On finding the appendix normal I went on to separate adhesions and search for the Fallopian tubes. The later stages of the operation had in view the prevention of the recurring attacks of peritonitis by shutting off ovarian follicles from rupturing into the peritoneal cavity, and was concluded by leaving no raw surfaces to re-form adhesions.

Note by Mr. Alban Doran.

This case is of much importance, as systematic writers teach that in true arrested development of the Fallopian tubes the remainder of the united portion of Müller's ducts—that is to say, the uterus—is of necessity involved in the malformation. In Mr. Spencer's patient the uterus was well developed. Three features of special interest should be borne in mind. First, traces of the fimbriae of the Fallopian tube were detected on the wall of the ovarian pouch where it was continuous with the broad ligament. This is what the modern embryologists, Francis Balfour, Arthur Keith, and others, would expect. The arrest of the tubal portion of Müller's duct was complete, but these authorities have shown that the fimbriated extremity of the Fallopian tube is derived from the pronephros, and not from Müller's duct at all. This condition is seen in the adult shark. "Kobelt's tubes," on the outer extremity of the parovarium, Wolffian body or mesonephron, are, we are taught, of pronephric origin also. Secondly, the knob which represented the Fallopian tube on the left side contained a small dermoid cyst. About ten cases of dermoid tumour of the Fallopian tube in our species have been reported, and Fromme and Heynemann review them in the new edition of Veit's *Handbuch der Gynäkologie*. Orthmann's monograph, *Ueber Embryoma tubae*, deserves special study. It is, indeed, strange that a disease so rare in the normal tube was found in this instance, where it was reduced almost to nullity. Lastly, let it be remembered, the round ligaments were well defined. This is the rule in malformations of Müller's ducts, especially in imperfect union of its lower portion with its fellow—that is to say, in bifid uterus. In the Journal, vol. i, 1899, p. 1389, I reported "The Removal of a Fibroid from a Uterus Unicornis in a Parous Subject." A small fibromyoma had developed in the fibrous band which represented the suppressed uterine cornu, yet the round ligament on the same side was very thick, far more developed than that connected with the other cornu, which had been gravid before, and was the seat of pregnancy after I removed the fibroid. The Fallopian tube was well developed on the side where the cornu was suppressed. Some authorities imply that precocious development of the round ligament is the cause of arrested fusion of Müller's ducts.

An Address

ENTITLED

THE QUICKENING SPIRIT.

BY

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In the slow and laborious process of the evolution of man towards his higher destiny certain moments appear as salient. Discoveries of natural laws, as that of gravitation, the utilization of the powers latent in matters of common occurrence such as steam, and the wonders of the microscope, are examples which readily suggest themselves. Even more notable for members of our profession are the discovery of general anaesthesia and the Listerian principles of surgical cleanliness. We are accustomed to regard such events more or less sudden because they have revolutionized hitherto accepted theories and practices. But we are certainly wrong in so doing. These epoch-making events represent in reality the fruition of a process whose germination, growth, and efflorescence have occupied long periods of time. For Nature does not work by hurricanes. We are conscious—it may be unpleasantly conscious—of the hurricane when it comes; but that is merely because we have been heedless, wilfully or ignorantly, of the premonitory symptoms of the cyclone, which the wise might, and ought perhaps, to have foreseen and forestalled.

In pondering over the manner in which I could most usefully employ the time so flatteringly placed at my disposal this evening, it occurred to me that, though very far from arrogating to myself a wisdom or a perspicacity above my fellows, inasmuch as I seem to discern in the trend of present-day medical thought a movement which is destined to occupy a great deal of time and interest in the immediate future, I might serve some useful purpose by endeavouring, however crudely, to focus attention on that movement, so that we may learn to utilize even what little is now known on the subject to the joint advantage of our patients and ourselves and the incidental undoing of the quack and the charlatan.

That mind exercises an influence over matter is a formula which most of us have lisped since the days of our childhood. The formula represents a belief, held strongly perhaps, but essentially vaguely, even by those who have had a scientific training, and it has not hitherto assumed anything which could be described as a definite outline. Such an outline I believe it to be now in process of assuming, and it is the part of those who take the profession of medicine seriously to contribute something out of the vast store of material which lies daily to their hands towards the elucidation of some of the difficult but fascinating problems which await solution.

In the human body every motive force is provided with a corresponding controlling force, and it is important to realize that the motive force itself is always developed in advance of the corresponding controlling force. When a child is born it has the power of contracting its muscles and thus moving its limbs, but it is a long time before it can so co-ordinate these muscles as to walk or otherwise accurately accomplish any purposive movement. Similarly, the new-born child, though able to defaecate and micturate, is unable for many months to control these primal acts to the point of bringing itself within the accepted canons of cleanliness. So much is recognized, but it is not so well recognized that the same laws obtain in the region of what is called the mind. Here the motive force is represented by the emotions—a child is all emotion and instinct—and the control force is provided by reason and

experience—that is, by the intellect and the will. Intellect and will are admittedly not identical, and they are associated here with the view of abbreviating the argument, without, I hope, vitiating it. It is of course quite clear that the development of the intellect and the will, with its consequent control of the emotions, will exercise a progressively modifying influence upon character, but is it true to say that this same development of the will at the expense, so to speak, of the emotions can exercise any moderating influence upon the *materies* of the human body, so as to render the tissues both less susceptible to disease and better equipped to combat disease when invasion has been successful? That it must be true is an opinion which is forced upon every thinking medical man by the experiences of his everyday work. They are commonplaces of medical literature which tell of chorea being provoked by fright, of an attack of the gout being caused by a fit of anger, of exophthalmic goitre being brought on by worry and anxiety; and works on psychology will furnish the curious with well authenticated instances of examples even more dramatic. When we come to inquire how such effects can be produced, our attention is immediately attracted by, and becomes focussed upon, the circulatory system. The physical manifestations of violent emotion are preponderatingly vascular. The lividity of rage, the blush of shame, the deathly pallor of alarm, and the ashen hue of excitement, are expressions which have been dear to the pens of writers since time began; and they describe, truly enough, what all of us have frequently experienced even in our own persons. Now, it must not be supposed that such vascular changes as these manifestations represent are confined to the integument; for, as Leonard Hill has shown, the pressure of the blood in the system at large is kept in a state of equipoise by the law which provides that a vaso-constriction in one part shall be immediately compensated for by a corresponding vaso-dilatation in another part; so that while the sudden cutaneous hyperaemia of the "blush of shame" proclaims an ischaemia elsewhere, so the cutaneous ischaemia of "pallid fear" denotes a compensatory hyperaemia in some possibly distant area.

If we now proceed to consider the effect of such vascular storms upon the economy generally, we have no difficulty in concluding that the customary working of the human machine must thereby be profoundly disturbed. So long as the circulation of the blood is smooth and orderly, its purification is regularly accomplished by the excretory organs, and its renovation adequately effected by the continuous supply of material from the contributory glands. If, however, instead of being smooth and orderly, the circulation is fitful and spasmodic, the excretory organs and contributory glands will be alternately gorged with sudden repletion and starved into astonished bankruptcy, with the result that the circulatory fluid itself becomes so fundamentally altered in composition that it imposes upon the tissues either an excess of what they do not require or an insufficiency of that which they demand. In view of such considerations it is surely not possible to doubt that violent emotions affect the physical health of their victim.

And if this be true of sudden and violent emotions overtaking people who are normally controlled, it must be equally true of those who, owing to defective education of the will, live a life of constant subordination to the caprices of their emotions. For it is not necessary that profound changes in blood distribution should be seen in order that they may be appreciated. Vascular perturbances may occur without either blushing or pallor; indeed, the emotional vascular see-saw, when it takes place between important internal organs, is even more likely to prove deleterious to the economy than when one of the parts affected happens to be the skin. Professor Osler,[1] in his recently delivered most illuminating Lumleian Lectures, says that "the profession is now riding on the top of a cardio-vascular wave," and I suppose I may be considered to have been caught in the trough of that wave when I ask you to believe that the physical ills which beset emotional patients are due primarily to circulatory causes. Such, however, is the position, and if I have succeeded in making myself clear up to this point, I have said enough to show that uncontrolled or misdirected emotions may, and do, by their action on the calibre of the blood vessels which supply the excretory organs and the replenishing glands, so affect the composition of the blood itself that the nutrition of the tissues is impaired.

If it be true that we are on the crest of a cardio-vascular wave, it is at any rate equally true that we are poised on the apex of a laboriously erected hillock of microbes, which I may say in passing has attained to such dimensions that we are in serious danger of forgetting that, important though the microbe may be, the soil is at least equally so; and I therefore make no excuse for drawing my first inference from the foregoing considerations with this hillock in full view. With the nutrition of the tissues impaired, the tissues themselves become bereft of their normal powers of resistance to bacterial invasion; in other words, the soil becomes unduly receptive, with the result that acute specifics of all kinds have a peculiar tendency to show themselves. I need only call attention to the fact that the period of life during which such troubles are most prevalent—namely, childhood and early adolescence—is precisely that period at which the emotions are fully developed, and are as yet but very partially controlled by the exercise of the will to point the moral of the example.

In the matter of the so-called functional neuroses, of which hysteria is the type, it is now very generally admitted that the ebullitions and caprices and vagaries for which they are famous are due primarily to the uncontrolled sway of the emotions, which, acting on the calibre of the blood vessels, produce profound changes in the easily modified functions of the brain and spinal cord. In the case of the hysterical seizure, for example, there would seem to be an ischaemia in some part of the central nervous system which is compensated for by the hyperaemia in the renal area, which is clearly the cause of the abundant flow of light-coloured urine which occurs as soon as the attack is over.

So far as metabolic diseases are concerned, I am myself inclined to believe, though I do not expect many to agree with me, that they are in a large measure the result of some disturbance of function in connexion with the internal secretory glands—the thyroid, the pituitary, the suprarenal, the ovary, the pancreas, and others. A study of one of these, the thyroid, will show that its functions are very easily disturbed—they are so far more frequently than is generally supposed—and that such disturbances are invariably associated with serious modifications in the normal circulatory phenomena. The same may be said of the ovary to an almost greater extent, and to a less extent of the pituitary and many of the others. Now, we have to remember that the function of each of these internal secretory glands is to supply its own particular essence to the blood plasma, and that if such essence is either excessive or insufficient in quantity, or if it is defective in quality, serious results will ensue. Nothing, surely, would be more likely to bring about any or all of these results at different times than such a fitful supply of blood to these glands as we have already seen to result from a general inadequacy of emotional control.

We have now reached the stage in this argument at which it ought to be clear that, surgical injuries apart, there is no type of disease which may not be provoked or encouraged by the action of the emotions when insufficiently curbed and guided by the development of the will. This proposition, stated baldly, would have seemed difficult enough to sustain, and I have purposely examined it at some length because I believe it to be a truth which we as a profession must hasten to recognize and act upon. For there are already serious unqualified competitors in the field; competitors who, having blundered upon this truth, are ignorantly exploiting it for their own purposes, to the detriment of the public when they fail, and the discredit of the profession when they succeed. For though the wholesale application of the principle provides them with a large measure of almost incredible success, their ignorance of its limitations will always ensure for them a wide margin of ignominious and disastrous failure. It is hardly necessary for me to say that no therapeutic agent of this nature, however potent, will avail anything against a large class of morbid conditions, such, for instance, as advancing degenerative disease, malignant neoplastic growths, or other conditions in which surgical aid is necessary or expedient.

The nostrum in which these people, Christian Scientists and others, deal, however variously it may be dressed, is the same in all cases. Whether with real piety it be

encased in a religious vestment, as at Lourdes and other shrines, or whether, with brazen effrontery and a crafty eye to business possibilities, it be smothered in a tornado of high-sounding but utterly meaningless verbiage, as in the book of Mrs. Eddy, the mainspring of all these systems nakedly expressed is the control which they impose upon the emotions. It is, doubtless, true that they substitute one overpowering emotion, faith, for a host of minor ones; but, so far as the health of the individual is concerned, the net result is all to the good, for his faith instils into him that all-essential control over the multiplicity of emotions whose unrestrained play had hitherto exercised such a baneful effect upon him. Now, how does faith accomplish these results?

Before setting myself to answer that question, let me say parenthetically that it is no longer possible to dismiss the whole question by casting doubts on the results themselves. Any one who will take the trouble to investigate the matter with an open mind will very soon be convinced of their reality. An attitude of obstinate unreceptive scepticism leads only to stagnation and death, and has certainly no place in an atmosphere where men are striving to unravel difficult and elusive problems.

But to return to the question of faith and its workings in the present connexion. I have already said that it teaches people to control their emotions, which is not only obvious, but is indeed its primary object from a religio-ethical standpoint; and from what has gone before it follows, I think, that by its control of the emotions it makes directly and strongly for an improved state of material health in the individual. That explains its prophylactic power, which is no less pronounced, and is indeed, in a sense, more remarkable than its curative power. It explains also its therapeutic power, though not perhaps in quite the same way.

A person who is thoroughly imbued with faith in an omnipotent and omniscient deity reconciles himself to tribulation by the consideration that his trials are imposed upon him by the inscrutable will of God; and his belief in the unfailing loving-kindness of that God leads him to turn his attention from his own pains in order to think intently upon his relations with the Deity. It is in this way that martyrs have suffered not only with equanimity, but, according to their own showing, with a degree of physical pain which was practically negligible, ordeals which to ordinary people would have been impossible tortures. The strength of their position is their power of turning their attention away from what is painful in order to concentrate it upon what is agreeable and hopeful. To accomplish this, however, the guiding and sustaining faith must be something better than the academic acquiescence which so often does duty in this direction; it must be the overweening and ever-present faith of the convert. Now, in ordinary people, this power does not come of itself, it must be educated. That which characterizes the hysteric is an entire absence of the power to concentrate the attention on anything except her own person. Faith, when it touches her, compels her to think of other and higher things, on which, by degrees, she learns to concentrate her attention. With her powers in this direction properly developed she ceases to be unduly emotional, and is able to relegate bodily discomforts to their proper sphere and to see them in their true perspective. What we have to realize is that this end can be achieved by means less questionable—and I say this with all reverence—than by appeals to the supernatural; for at their very best such means have the disadvantage of being in themselves essentially emotional, and at their worst are apt to sink to the lowest depths of quackery and charlatanism.

It may be objected that the question of a rational education of the will with a view of subduing the emotions is one which concerns parents and teachers rather than medical men. In its widest sense this is no doubt true; but as medical men we are called upon to deal with the individual, whom it is our duty to help in every possible way. Now I make so bold as to say that if we fail to place before him the power which resides in him—and in him alone—of ameliorating his condition, then we are neglecting or evading an obvious and paramount duty. It is a good thing to engender in the patient a confidence that we and the methods we employ are able to guide him into the way of peace; but it is a much better thing to arouse him to a full sense of his own powers in the same direction. This is the factor which in modern therapeutics is being neglected. Patients have learnt to expect from us only such aid as is purely material, whether it be surgical or medicinal, because it is this kind, and this kind only, which we have been in the habit of offering them. We do not speak to them of the mental aspect of affairs, largely, I suppose, because this aspect is so often regarded as being entirely concerned with character—a matter in which it savours of impertinence in us to interfere. That such is very far from being the case I have already endeavoured to show, and I am here to plead for a change of policy in this direction; not that we should turn aside from the study and investigation of material phenomena which we have been, and still are, prosecuting to such excellent purpose, but that we should combine with the benefits thus opened to us those which are to be obtained by enlisting the aid of the mind.

I should indeed be inviting you to make bricks without straw if I were to call upon you to do this thing without appending some suggestions as to how it should be done. Such suggestions as I have to make are of the simplest possible description, for in a matter of this kind each individual must develop the details of the method along the lines which most befit his character and temperament. The essential point is that he should have a clear idea of what he wants to do, and that he should pursue that end with determination and perseverance. I have tried to show that his object is to awaken in his patient a sense of her own powers, her own dignity, and her own superiority to the littlenesses by which our lives are inevitably beset; that he should teach her so to educate and control and order her thoughts and sensations that she may learn to dominate them, instead of allowing them to dominate her. In our attempts to do this, which at first may seem fruitless enough, let us consent to do without such adventitious aids as hypnotism. But do not misunderstand me on this point. Not only have I nothing to say against such methods, but I can testify with admiration to the benefits which in the hands of the competent they are capable of conferring in suitable cases. But the public distrusts these methods, and inasmuch as it is essential to our mission that we should merit the confidence of the public, they are in ordinary circumstances much better discarded. Moreover, except in very extreme borderland cases, they are unnecessary. What in general practice can be accomplished by hypnotism can be accomplished even more effectually by a direct appeal to the patient's better self, supported, it may be, in the case of the very young, by specially directed educative efforts. In the next place, bearing in mind the difficulty and complexity of the subject and the necessity for training ourselves in the most successful methods of evoking and fostering the necessary control in our patients, let us content ourselves with small beginnings. It is well to make the first essay in a person of breeding and intelligence, in whom we feel that there is something to which an appeal can effectively be made. Take, for example, a woman of over 40, who is just beginning to feel the stress of the approaching climacteric, with its vague but intensely unpleasant subjective sensations, its vascular vagaries, and its internal secretory chaos. Such a woman may be intellectually above the average, and not, hitherto, conspicuously uncontrolled; but she is face to face with a trial in which all the control she can command will prove too little unless it be provided with reinforcements. Such reinforcements are now sought in various directions. A few find comfort in religion; others, less fortunate, invoke the aid of drugs, among which brandy, morphine, and cocaine are the most common, while a third set appeal with confidence to the operating surgeon. But these, except perhaps the first, are vain things, for the only really effective aid must come from within; and this is the point upon which it is our duty continually to dwell. In connexion with such a case let us consider a symptom about which we are so often consulted, namely, insomnia. To have recourse to drugs is a procedure which every conscientious physician will, in such circumstances, postpone until all else has failed. To appeal to the influence of mind over matter may fail—in the hands of the inexperienced it probably will fail—but it can at any rate do no harm. And how is that appeal to be made? There may be better ways, but the one which I usually adopt

is as follows: I begin by pointing out that it is a mistake to elevate sleep into a fetish; that the world does not come to an end because one person, however important, is unable to sleep; and that the most certain method of keeping such an elusive entity from embracing one, is in pity to implore its advent with outstretched hands or to summon it peremptorily and impatiently with clenched teeth. In order to prevent the question of sleeplessness from obtruding itself, I then explain the importance of concentrating the attention on something definite. Then comes the difficulty. Everyone has tried the expedient of contemplating imaginary lambs jumping over a gate, which has always proved useless. It is then necessary to insist that it has proved useless for a very obvious reason. To think of lambs jumping over a gate for half an hour on end requires a degree of concentration given to very few; and seeing that the patient's power of concentration is weakened by her present state it is well to embark upon some less heroic venture. The desire for the heroic in these patients is insatiable. To bring them down to earth, baldly and even brutally, is a necessary preliminary to any successful appeal. With this end in view, instead of the saltatory sheep I invite them to think of something pleasant and attractive, but calm and reposeful. To the romantic I suggest the moonlight on a quiet sea, the sun on upland meadows; to the more material, a comfortable armchair in front of a fire, or a warm bath, scented, it may be, with pumuline or other essence; but—and here is the crux—they must go on thinking about it. They must concentrate all their attention upon it, and must not be surprised if at first the charm fails to work. When the attention tires, a not too interesting book may be temporarily appealed to, and then the experiment repeated. If the patient can be induced to act thus for several nights in succession without allowing her thoughts to revert in pity to her sleepless state, it is astonishing what success will often ensue; more especially if, by an appeal to her reason and proper pride, you have succeeded in enlisting her real co-operation.

I have used insomnia as an instance, but the principle of which it is an illustration is of almost universal application. We have to teach our patients to exercise determination in thinking of the agreeable and the hopeful in order that their thoughts may be deflected from the unpleasant and the material. The practice of the moment is unfortunately in the opposite direction. By a legitimate and laudable interest in our work, coupled, it may be, with a pardonable pride in our special knowledge, we are led—far too often led—into a little disquisition, a miniature clinical lecture, upon the malady in question, with the result that the patient's whole attention becomes morbidly focussed thereon, to the utter nullification of our best directed textbook therapy. To abandon this position in order to occupy that for which I plead would be something in the nature of a revolution; and it is because I feel that such a revolution is upon us that I have preferred to discuss this somewhat thorny question rather than invite your attention to some subject of more strictly medicinal interest. We can no longer afford to neglect the aid of the mind as a therapeutic agent. It refuses to be neglected. It is daily and hourly becoming more insistent for the recognition of its legitimate claims, and, if it does not obtain recognition at our hands, it will seek and obtain it elsewhere. It has been my endeavour to place these claims upon a scientific basis, and if I have been even partially successful I shall be encouraged to feel that I have done something to merit the honour, which I esteem so highly, of having been invited to address you to-night.

Reference.
[1] *Lancet*, March 6th, 1910.

The second International Congress of Alimentary Hygiene will be held in Brussels from October 4th to 8th. Among the subjects proposed for discussion are the following: Professor M. Dastre of Paris, "The ultra-violet rays and their application to alimentary hygiene"; M. Bordet, Director of the Pasteur Institute, Brussels, "Hygiene and bacteriology." Members and associates (subscription 20 fr. and 10 fr. respectively) are admitted free to the Universal Exhibition during the time of the congress. Special railway facilities have been arranged. Further information may be obtained of the Honorary Secretary, Mr. Cecil H. Cribb, 136, Shaftesbury Avenue, London, W.

SEVENTY-EIGHTH ANNUAL MEETING
OF THE
British Medical Association.

Held in London on July 22nd, 23rd, 25th, 26th, 27th, 28th, and 29th.

PROCEEDINGS OF SECTIONS.

SECTION OF SURGERY.

Sir Victor Horsley, F.R.C.S., F.R.S., President.

PRESIDENT'S INTRODUCTORY REMARKS.

Sir Victor Horsley, acting in accordance with the unwritten rule that Presidents of Sections should not deliver formal introductory addresses, initiated the proceedings by a few words of welcome to the foreign guests and ordinary members of the Section, and then called for the opening of the first discussion.

DISCUSSION ON THE SURGICAL TREATMENT OF GRAVES'S DISEASE.

OPENING PAPERS.

I.—Professor Kocher, Berne.

We have gained, during recent years, a clear comprehension of the etiology of Graves's disease and of the differences in the symptoms and prognosis of different cases, and this has naturally brought us to the choice of different ways of treatment. Surgical treatment has given decided proofs of the correctness of Möbius's theory of thyreogenous origin of Graves's disease. On the one hand we can show (as I did in 1883, by analysing my first 100 cases of excision of goitre) that by taking away the goitrous thyroid gland entirely we produce myxoedema in the form of cachexia strumipriva and that slighter cases of the same condition sometimes follow partial excision. On the other hand, we can now show with equal precision (according to a law I formulated at the Congress of International Medicine at Munich in 1906) that by taking away more or less of Gravesian goitres we produce no myxoedematous state, and obtain a more or less complete cure of the Graves disease. There cannot be much doubt, therefore, that in the latter disease we have a pathological condition of the thyroid gland opposite to that which exists in myxoedema; in other words, we have hyperthyreosis instead of hypothyreosis.

Then again, we can, thanks to Murray, cure myxoedema by administering either the extract of thyroid gland or injection; and conversely, we can aggravate Graves's disease by thyroidine, iodothyroine, or other thyroid preparations. Moreover, it has been proved that with thyroid extracts we may even produce an artificial Graves's disease, even in cases of aplasia thyreoidea in myxoedematous people. Again, therefore, we must conclude that it is an excess of substances produced by the thyroid gland which causes the symptoms of Graves's disease; and lately more direct proofs have been given that it is the excess of a real secretion of the thyroid gland which is the *initial* feature in Graves's disease.

I made, at the Congress of the German Society of Surgery at Berlin, April, 1908, a communication on the changes observed in the blood in about a hundred cases of Graves's disease, and then came to the conclusion that—always taking into consideration the whole clinical features of a case—we have in such examination of the blood a very important assistant in *diagnosis* as well as *prognosis* in this disease.

I found that the essential feature of the blood change consists in a great diminution of the polynuclear cells, these going down from 5,000 of the normal blood to 1,260 per millimetre cube, whilst the small mononuclear cells—that is to say, the lymphocytes—show a relative

increase in number—namely, from 20 per cent. of the normal blood to 50 per cent. and more, and sometimes an absolute augmentation from 1,500 to 2,000 of the normal blood to over 5,000.[1]

Caro, v. Jagic, and others have confirmed this fact, and Kostling[2] has added that the large mononuclear cells diminish step by step with the polynuclear, so that he thinks v. Jagic's point of view correct—namely, that these two forms have the same origin, the mononuclear being only a form of the polynuclear.

Lately Miss Charlotte Miller[3] has found analogous changes in the blood in cases of "simple goître"—that is to say, a hyperlymphomatosis from 30 to 50 per cent.,[4] and a hypopolynucleosis down to 50 per cent. of the normal or more. As in Graves's disease,[5] the essential feature is the absolute diminution of the neutrophile (polynuclear) forms.

I admit that there exist cases of undoubted Graves's disease in which no important change in the blood is to be found, but they are very exceptional. Kostling explains this fact by a theory put forward by Hess and Eppinger, founded on observations made by Kraus and Friedenthal, that thyroid extracts have a double influence, increasing the tonus of the sympathetic system on the one hand, and of the vagus system on the other.[6]

Eppinger, Falta, and Rudinger have come to the same conclusion, and Kostliog has tried to show that we have to distinguish two forms of hyperthyreoidism, the one with hypertonia of the sympathetic system, the other of the vagus. The latter would be a secondary phenomenon in the sense of a compensatory change. He thinks that the most important sign of hypertonia of the sympatheticus is (according to Fränkel) adrenalinaemia (which can be demonstrated with a modification of Ehrman's method) and dilatation of the iris on instillation of adrenalin. The lymphocytosis, he thinks, is a consequence of hypertonia of the vagus (that is to say, a phenomenon of reaction), as he could produce artificial lymphomatosis by injection of extract of the pancreas.

What I wish to say for the moment is that in doubtful cases of Graves's disease I am not willing to accept a diagnosis of the latter disease if the blood test does not give a positive result. In the exceptional cases where I could not find it in real Graves's disease other signs of the disease were sufficiently well marked to make the diagnosis clear.

I ought to lay stress on the point that we have to distinguish a physiological from a pathological hyperthyreosis. I cannot at all admit, as some American authors are inclined to do, that we may be allowed to identify hyperthyreoidism with Graves's disease, or to go so far as to find an indication for an operation in the simple fact of the existence of signs of hyperthyreosis.

When a larger amount of thyroid secretion is needed by the healthy organism, as it is at the age of puberty, in pregnancy, and in some diseases, hypertrophic swelling with hyperactivity of the gland means a useful physiological process, and it is a great mistake to interfere by operation, as is sometimes done, thus bringing the operative measure for real Graves's disease into discredit.

We must therefore always examine the blood in making a diagnosis. It may be that with the improvement of methods we may find it very useful to investigate, also if there exists an adrenalinaemia or Löwi's sign in these cases. At any rate, we must be glad to have got a new and important indication for the distinction of true Graves's disease from the so-called pseudo-Basedow's, Basedow's "formes frustes," and other forms of nervous disorders. My son, Albert Kocher, will soon publish his and my view on the manner of looking at lymphomatosis, with Kostliog, as a kind of reaction.

Here I may say that we have found that after successful operations, when a patient may already feel a great deal better, he may be, according to our examination, still only incompletely cured, for the lymphomatosis may remain for a while, or even continue to increase. On the other hand, when we have arrived at a *complete cure* (sometimes by repeated operations), the blood also becomes entirely normal in every way. So the blood test becomes a very valuable indication of the progress of a case towards healing if we keep in mind that hyperlymphomatosis is one feature of the blood in this malady. In Graves's disease the diminution of the total quantity of leucocytes—that is to say, a leucopenia with absolute diminution of the neutrophile cells—is another still more important point.

When we find that there exists lymphomatosis in "ordinary" goître we may decide, by counting the total quantity of leucocytes and the absolute number of polynuclear forms, whether we have to do with a combination of goître with Graves's symptoms or if we are to look on this anomaly as a sign of hypothyreosis, since we frequently find increase of lymphocytes to 30 per cent. and 40 per cent. in myxoedema. With this, however, there may be a normal number of leucocytes as a whole.

Dr. Turin, assistant in my clinic, has proved experimentally that lymphomatosis can be produced by injection of thyroidine as well as by appropriate doses of iodide of potassium in individuals who have no atrophy or aplasia of their thyroid gland.

Happily, we have another very good control for the distinction of hyperthyreosis and hypothyreosis, namely, by determining the index of coagulation of the blood, and thus complete our estimate of the disease by the state of the blood.

Miss Lidsky, one of our students, has, under the guidance and help of Kottman, examined the rapidity and intensity of coagulation of the blood in 37 of my Graves's disease cases on whom I have operated both before and after the operation.[7] The examinations have been made with an apparatus invented by Kottman, called a "coaguloviscosimeter."

Dr. Kottman has found that the normal human blood at 20° C. gives the beginning of coagulation after 18 min., and the end of it at 23 min. Out of 37 Graves's cases, 29 gave a much slower coagulation (78.3 per cent.), 2 gave normal coagulation (5.4 per cent.), and 6 gave a quicker coagulation (16.2 per cent.).

Of the cases in which the coagulation was normal one had already been operated on by me, over a year before, with excellent result; the others, two months before the blood was examined. The same good result of the operation has been found in 3 other cases where the blood was examined before and after the operation, where the coagulation was slow before and normal, or nearly normal, afterwards.

Out of the 6 cases of Graves's disease in which coagulation was found to be exceptionally quicker, 2 had been under treatment for a long time with phosphate of soda in large doses, and 3 of the cases were particularly severe cases.

Besides the slowing of coagulation, its intensity was found to be greatly diminished. Thus the examination of the coagulability of the blood is an important aid in the diagnosis of Graves's disease, and at the same time a great help in controlling the effect of medication as well as of operation in the cure of the disease.

Miss Lidsky has, with Dr. Kottman, made a control of the effect of injecting extract of thyroid gland on the coagulability of the blood in rabbits and dogs. She injected 4 to 6 tabloids of thyroidine (Burroughs and Wellcome's) diluted with physiological salt solution (50 c.cm.). In rabbits the beginning of coagulation was at 9 min. instead of 6 min., and the end at 13 min. instead of 11 min. If the injections were repeated daily, the beginning was delayed to 14 min. and the end to 23 min. Also the intensity of coagulation was greatly diminished. This was still

[1] The fact that we have a great increase of lymphocytes at the same time with decrease of polynuclear cells might be considered as the more important as the former, whilst the proteolytic cells act in the opposite way.

[2] Kostling, Grenzgebiete, 21, 1910, *Ueber chronische Tyreotoxicosen.*

[3] *Mediz. Klinik*, 1910.

[4] In opposition to the finding of Kostling in Graves's disease Miller has found that the *large* mononuclear constitute a large part of the increase of the lymphocytes.

[5] So Miller thinks in her cases also.

[6] Certainly there exist notable differences in some cases of Graves's disease, as there may be in one case exophthalmos in a high degree, very pronounced vascular symptoms with large swelling of the thyroid, in the other no exophthalmos (as I have already pointed out at the meeting of the Medical Society of London four years ago), brownish discoloration of the skin, and very rapid pulse; but I am not prepared to give now a satisfactory explanation of these differences. There exists, according to Eppinger, Falta, and Rudinger, an exciting influence from the thyroid gland to the adrenals and vice versa. O. Wiener was able to increase the quantity of thyreoglobulin in the thyroid gland and the percentage of iodine alnica by administering adrenalin. There may be, therefore, many combinations of factors to explain the occurrence of different clinical symptoms.

[7] The results are to be published at Berne, by Anne Lidsky.

more the case in dogs when large doses of thyroid extract were used (168 tabloids on the whole were given to one animal). It is interesting to see that a fluid extract of Poehl with glycerine did *not* produce the same effect.

I may call your attention also to the investigations of Hugo Wiener,[8] proving that the thyreoglobulin of Oswald, which is found in the colloid of the follicles of the thyroid gland, does not coagulate like the proteid of other organs (cf. Poehl) at 40° C., but even delays the coagulation of other proteid substances. Pineles and Piok[9] also found that the secreted proteids (thyreoglobulin) produced the physiological effect of the whole gland, but not so the "Organeiweiss" of Notkin.

Miss Lidsky has, with Dr. Kottman, examined a series of 8 cases of spontaneous myxoedema and of cachexia strumipriva after operation; she has been able to show that in these cases, contrary to the results of blood examination in Graves's disease, the rapidity of coagulation as well as the intensity is greatly increased, the beginning of coagulation occurring after 4 min. and ending at 6 min. This result did not depend on any great change in the *absolute* quantity of erythrocytes, leucocytes, or the percentage of haemoglobin; thus, in a case where the haemoglobin was at 95 per cent., the red corpuscles at 4,622,000, and the white at 5,760, the coaguloviscosimeter gave the beginning of coagulation at 4 min. and ending at 12 min. The white corpuscles showed the differences spoken of above. It is particularly interesting that after transplantation of thyroid gland into a bone (Kocher's method), and after introduction of thyroid extract by mouth, the coagulability changed in one case from commencing at 4 min. before treatment to 10 min. afterwards, and from ending at 6 min. to 16 min. after treatment.

Miss Lidsky and Kottman have also examined 11 cases of ordinary goître, and have shown that the form of coagulation of the blood proves in the majority of these cases that ordinary goître is, as a rule, combined with a certain degree of hypothyreosis. It is not at all astonishing that there are exceptions to this rule if we consider that what is called struma nodosa may be combined with a hypertrophic development of healthy thyroid tissue between the diseased parts, or even with the histological changes of exophthalmic goître in some part of the gland.

Nature does not follow our tendency to systematize into categories the pathological changes in an organ, but shows the most varying combinations of colloid goître and hyperplastic goître, of hypothyreosis and hyperthyreosis, to such a degree that very able men, as Cyon, Oswald, and Lenhartz, have considered Graves's disease to be only the beginning of a hypothyreosis, and have thus been led to very false conclusions as to treatment. Graves's goître may in later stages change into atrophic goître, as colloid goître may become histologically under the influence of treatment a Graves's goître, but that is no reason why we should not support a strict distinction between the ordinary and regular cases of both diseases.

A further and very important indication of the importance of functional hyperactivity of the thyroid gland in Graves's disease is the fact of the existence of what I have called "iodine Basedow"—that is to say, an artificial Graves's disease evoked by the administration of iodine by mouth or subcutaneously. I have given the results of my observations on that subject in a paper read at the Congress of the German Society of Surgery at Berlin in the spring of 1910.[10]

If we administer to nervous patients affected with goître iodine preparations in strong doses, we may see most of the symptoms of Graves's disease develop in a short time. I have seen such cases, especially in persons who had intrathoracic goîtres going far down towards the mediastinum. These people suffer a great deal from shortness of breath, sometimes with crises of suffocation, and at the same time these patients are particularly exposed to the complication Professor Kraus has described as "Kropfherz," in consequence of their dyspnoea, and very probably also of direct influence on the nerve supply of the heart. I have still more frequently seen the full symptoms of Graves's disease developed after iodine treatment in persons who gave already before treatment a history of some signs of hyperthyreosis—that is, complaining of occasional palpitation of the heart, bad sleep, nervousness, and great fatigue. All such people may develop under iodine treatment the characteristic clinical type of Graves's disease in a few weeks, or even more rapidly.

I have been able to show that in some of these artificial cases of Graves's disease the characteristic changes in the blood are also found, and that the symptoms disappear in a short time by appropriate treatment, especially excision of the gland. The chemical examination of this latter shows an exceptionally large amount of iodine in it, amounting to 50 or 60 mg. of pure iodine, or even more. It is of great practical interest to note that when iodine treatment is persisted in for too long a time, or when no early measures against the affection are taken, this artificial Graves's disease may get worse and the patient may die under the same circumstances as in spontaneous Graves's disease, especially with heart failure. After too long continuance of the iodine treatment operative measures may even fail by becoming too dangerous and producing a sudden fatal issue.

If we keep in mind the fact that we may produce artificial Graves's disease in goîtrous nervous people by administration of extracts of the thyroid gland (thyroidine); and, on the other hand, that we are not able to produce artificial Graves's disease in cases of hypoplasia of the thyroid gland and myxoedema by the use of iodine preparations, though easily by the application of thyroidine and other thyroid gland preparations, we must come to the conclusion that it is by stimulation of the function of the thyroid gland with excess in its secretion that iodine produces pathological hyperthyreosis. O. Wiener has been able to prove directly that by the administration of sodium iodide the contents of thyreoglobulin in the gland and the symptoms of pathological hyperthyreosis or artificial Graves's disease were greatly increased.

Pineles[11] has added to our statistics a series of cases proving the complete sensibility to iodine preparations in goîtrous people belonging to families the members of which are affected with Graves's disease or diabetes.

The type of artificial Graves's disease we call iodine-Basedow is the more interesting as it has been proved directly by many researches (Bruns, Baumgarten, and de Lignevis, assistant in our clinic) that iodine increases the secretion of the thyroid gland, the follicles are filled with colloid matter, and in experimental as well as in clinical (according to our own observation) cases we may see in the beginning of iodine treatment a notable swelling of the gland. But we know very well also that after this initial period the goîtrous gland begins to decrease, and this is the effect we try to produce with iodine treatment. We must conclude that the iodine which the gland cells take up with great avidity, and which combines with the colloid material filling the follicles, increases also the excretion of the same material in the blood or the lymphatic vessels. This is most important. Artificial Graves's disease comes on in a severe form only when goîtres disappear rather quickly under the influence of iodine. The gland may still contain a rather large quantity, but if too much is kept back there are no symptoms of hyperthyreoidism.

With true Graves's disease it is quite the same. A great many authors have found that the goître in this disease contains an unusually small quantity of iodine, because it is excreted as quickly as the organic iodine combinations have been formed in the glands. But, according to Oswald's and Albert Kocher's preliminary communications, in the worst cases the diseased gland may contain unusually large quantities of iodine, when there exists an excessive attraction for this material, so that only part of it can be distributed in the general circulation (in organic combination).

Now, if we ask how the amount of transformation of the iodine in the thyroid gland and of the excretion of the iodine globulin is controlled, we must come to the conclusion that it must be by nerve influence. Further, though it seems (by all clinical experience) certain that we must accept the fact of the existence of an internal secretion of the thyroid gland, which is of the highest importance for the maintenance of the normal function of the nervous system and of other organs, and that we may explain the symptoms of myxoedema, cachexia thyreopriva,

[8] *Arch. für exper. Path. u. Pharm.*, Bd. 61.
[9] *Zeits. für exper. Path. und Therap.*, Bd. 37.
[10] The paper will be published this year.
[11] *Wien. klin. Woch.*, 1910, No. 10.

and cretinism by the want of that internal secretion, and the symptoms of Graves's disease by some excess of the same, it is desirable to gather further proofs of the existence of that secretion.

Physiologists, after the decisive experiments of Sir Victor Horsley on that secretion, have to a great extent cleared up the question of the function of the thyroid gland, and lately Asher of Berne has tried to give a direct proof of the fact of real glandular secretion, based on the experiments of Falta, Rudinger, and Eppinger, showing that the thyroid gland and the adrenals have an influence on each other. Asher and Flack have investigated the effect of excitation of the thyroid nerves upon the action of adrenalin. After injecting a given dose of adrenalin they have measured exactly the increase of blood pressure, first, without any other procedure, and secondly, after irritating electrically the cut end of the laryngeal nerves, which are very powerful dilators of the thyroid vessels. They found that the same doses of adrenalin have a much greater effect if at the same time the excitation of the thyroid nerves took place.

It is true that it was necessary to cut at the same time the depressor nerve. Cyon had tried to show that iodothyrine has a pronounced excitatory effect on the depressor system. Asher and Flack have been able to confirm the fact that when the inferior laryngeal nerves were excited electrically the excitability of the depressor nerve was greatly increased. Not to counteract the effect of the adrenalin in the above experiment they had therefore to cut the depressor.

By their experiments Asher and Flack think they have proved decisively that there exists an internal secretion in the thyroid gland, which may be activated by the irritation of the nerves of the gland going to the vessels as well as to the epithelium itself. This fact, if confirmed, is very interesting, as it explains why in some cases the ligature of both inferior arteries has produced a very favourable effect on the symptoms of Graves's disease.

We have seen cases when by the ligature of the upper pedicle of the thyroid gland on one side the blood already has shown a remarkable change. So in one case the total number of leucocytes went up from 4,900 to 7,200, the neutrophiles from 1,886 to 4,010, and the lymphocytes diminished from 51 per cent. to 37 per cent. According to Asher and Flack's demonstrations it is necessary to ligature the *whole inferior pedicle* to cut off the influence of the nerves entirely.

Let me remind you that some experiments have already been published showing the probability of trophic nerves (secretory nerves) of the thyroid gland existing. Katzenstein has found an atrophy of the epithelium with change into colloid by cutting the laryngeal nerves, and Hugo Wiener[13] has found that after excision of the inferior cervical sympathetic ganglion the thyreoglobulin of the thyroid gland is greatly diminished in quantity, and the quantity of iodine in the gland as well. As this is not the case after the excision of the superior ganglion, he concludes that the secreting fibres of the lymphatic nerve ascend probably from the fifth and sixth cervical nerves. Morat[13] also was able to produce a swelling of the thyroid gland by exciting the sympathetic nerve. If this be so, we understand the action of galvanization of the sympathetic in the neck, which certainly, in some cases, brings an amelioration in some symptoms of Graves's disease. Also, we might ask, if Jaboulay's experiment with excision of the cervical sympathetic may not, if properly executed, have an influence on Graves's disease; but then, according to Hugo Wiener's experiments, it would be necessary to take out the inferior and not the superior ganglion.

If we are able to show that the primary cause of Graves's disease may be an excessive irritation of the nervous system, affecting especially the sympathetic branches of the thyroid nerves, and that the same pathological effect may be produced by the *excessive influence of iodine* on a gland already altered in its histological constitution, or by *excessive reaction* of the same under pathological circumstances, as after acute infections, we might seek for rational treatment in the first place by way of removing the causes of the pathological condition.

Experience proves that this is not sufficient in most of the cases. Rest, rest, and rest again is the great remedy of medical men when excessive excitement has given rise to a sudden outbreak of Graves's symptoms. Most of the remedies given besides the rest cure are of no use, especially the digitalis preparations given so frequently. I think still the best medical treatment is by phosphorus preparations. But, on the whole, it is best for the medical man to tell the patient to do nothing and to do nothing himself. To exclude all iodine preparations is the best means against what we called "iodine Basedow." To direct careful attention to this point is in many cases more important than the giving of any remedy. Excessive functional activity has in most cases led already to histological changes the same as those produced by infectious diseases, and so conventional treatment fails to produce the desired effect.

We must not, then, wait and risk the prolonged poisoning of the system which will produce irreparable organic changes in the heart muscle, the kidneys, the liver, the brain; we must treat the diseased organ itself and diminish its activity by diminishing the quantity of secreting cells; we must exclude, by cutting the superior pedicle, the nerve influence and produce partial atrophy by ligature of the vessels or perform partial excision in sufficient quantity to reduce the secretion to normal degree. I can prove that this is practically possible without damaging our patients in any way or risking their life; therefore surgical interference is the only sure and quick way to come to a real cure, but it must be kept in mind that it should be done only after most careful consideration, as I shall presently show.

Let me give you the results of my practice on the ground of these considerations, so that you may judge for yourselves as to the value of surgical interference.

I have performed up to this day 4,394 excisions of goitre. These include 469 cases of Graves's disease. The total mortality of these 469 cases is 3.4 per cent., but the mortality has always gone down, being at 5 per cent. when I gave a report at your medical society of 176 cases, four years ago, diminishing in the 155 cases of Graves's disease which the fourth thousand of our goitre operations include to 2.5 per cent., and finally in the 72 cases of Graves's disease operated on since January of this year only 1 patient died, which means a mortality of 1.3 per cent. It may be that we will bring the mortality still lower down, as has been the case for ordinary goitre, going down to ½, 1.2, 1.3 per cent., since the death mentioned in the last series was one of a young woman affected with nephritis, upon whom it would have been better not to have operated at all.

This brings us to the question of the *contraindications to operative interference*. The more I have seen of the disease the more I have been convinced that the continuous poisoning of the system with thyroid secretion brings on in long-standing cases organic changes in the heart muscle, in the kidneys, in the liver, in the pancreas, and in the cells of the cortex cerebri.

Crile[14] has shown that the cells of the cortex cerebri, of the cerebellum and medulla may show alterations leading to complete destruction of many cells. He therefore insists that in operations on Graves's patients, everything must be avoided which might increase the already existing damage to the brain, above all *mental shock*. He was able to produce analogous changes in rabbits by frightening them. He is of opinion that these changes may give rise to rapid collapse. I also have seen in some of my cases, when death comes on very suddenly after operation, that these patients seemed not to gain their full consciousness after the operation and died with rising temperature and extremely quick pulse. There must be analogous alterations in the ganglionic apparatus of the heart after long-standing Graves's disease, and weakening of the muscle of the heart by degeneration (myocarditis). In every case when the pulse has become very irregular, especially in respect of tension, there is a danger of heart failure after the operation.

As to the pancreas, Eppinger, Falta, and Rudinger have shown that a connexion exists between the thyroid gland and the pancreas, and for this reason the digestion may be affected, and especially diarrhoea and glycosuria produced, both being very favourably influenced by treatment with trypsin. We shall in a short time publish our experience

[13] *Archiv f. exper. Path. u. Pharmac.*, Bd. 61.
[13] *Presse méd.*, 1897.

[14] *Annals of Surgery*, June, 1910.

on glycosuria in the form of alimentary glycosuria as well as diabetes, and the good results of trypsin treatment. The liver probably is secondarily affected.

Still more important is the existence of albuminuria with nephritis. These cases are in later stages of the disease not very rare, and operation on such patients offers even greater risk than with the organic alterations mentioned above. We have seen more than one case where albuminuria and nephritis were combined with floating kidney, and existed on the same side. In such cases I do not operate before the symptoms have disappeared, wholly or nearly, under treatment.

The greatest risk of all is that of a *combination with status lymphaticus*—that is to say, with swelling of the lymphatic glands, the thymus, and the spleen. I can show that in not a few of our fatal cases sudden death was to be attributed to such complication. Whilst most of the other organic changes are the consequence of a long duration of the disease, status lymphaticus may develop rather early. It is very satisfactory to say that even in cases where we found irregular heart action, glycosuria, and albuminuria, we have seen a complete *restitutio ad integrum* when we had succeeded in avoiding the immediate post-operative dangers—a fact which seems to be a valuable proof of the poisonous effect of thyroid fluid on the different organs of the body.

I am convinced that when general practitioners and physicians carefully consider these very dangerous consequences of long-standing Graves's disease they will no longer take upon themselves the responsibility of delaying an operation which gives, when applied early, such very striking results.

A. Kocher said, in his address to the American Medical Association, 1907, that we have not seen a single case in which the patient had not been benefited by the thyroid operation.

Crile,[15] a very able observer, says: "I have seen no case that was not benefited by operation . . . and I know of few classes of cases that experience such deep and fundamental relief as cases of acute toxic Graves's disease successfully operated upon."

I have heard more than once from my patients after operation that they only knew what real mental quietness meant after the immediate and fundamental relief by operation.

If the members of this Surgical Section appreciate the benefit which a patient suffering from exophthalmic goitre can derive from a careful and early surgical interference, go and tell your friends practising internal medicine to help on the accomplishment of a cure of that severe and dangerous disease, and not oblige the surgeon by a late operation, as Crile says, "after the ship has gone on the rock, to deal with the wreckage."

II.—Hector Mackenzie, M.D., F.R.C.P.,

Physician, St. Thomas's Hospital, and Brompton Hospital for Consumption.

There is no doubt in my mind that most of the symptoms which are considered to be characteristic of exophthalmic goitre are usually related to and centre round an over-active thyroid gland. We are familiar with the results of overdosage with thyroid gland or its preparations. We know how under its influence the rate of the heart becomes accelerated, the skin takes on increased action, the processes of metabolism are stimulated, and there is loss of body weight. Gastro-intestinal disturbances are apt to be produced, and the subject becomes tremulous and excitable.

Although in no cases in human subjects, as far as I know, has exophthalmos been produced by the administration of thyroid substance, Mr. Walter Edmunds has observed this phenomenon in monkeys and dogs produced in this way. The symptoms with which we are familiar in the subjects of exophthalmic goitre—with the doubtful exception of exophthalmos—are similar to those which arise from overdosage with the secretion of the thyroid gland. That the thyroid gland at certain stages of exophthalmic goitre is overactive is supported by the evidences of its increased blood supply and by the microscopic appearances, showing increased secretory activity with hyperplasia of the epithelium, strikingly similar, as Mr. Walter Edmunds has pointed out, to the changes of the nature of compensatory hypertrophy which take place in a small portion of a gland left behind when a large portion has been experimentally removed from an animal. It has been found also by Oswald and Albert Kocher that in cases of exophthalmic goitre, where colloid material is present in the follicles, there is an extraordinary increase in the amount of iodine. In one lobe they found as much as 10 to 50 mg., while in a normal thyroid the iodine content varies between 2 to 9 mg. Sometimes, it is true, the iodine content may be low, but this may only be the consequence of rapid absorption of the secretion. We are justified, therefore, I think, in concluding from the symptoms of the disease and the evidences in the gland itself of overactivity, that the latter plays the leading rôle in the production of the disease. I would, however, point out that the severity of the symptoms seems in no way to be proportional to the size of the enlarged gland—that, as a rule, it is in the cases with a moderate enlargement which are of the severe type that often as the patient gets worse the gland becomes smaller, and that in some of the worst cases of the disease there is no appreciable enlargement of the gland at all.

But now we come to the important question—What is it which excites the thyroid gland to its overactivity? Can we not get at the cause of its overactivity? Is there some toxic substance circulating in the blood which calls forth the effort of the thyroid gland to neutralize it? The regulating power of the gland seems to be thrown out of gear by some abnormal stimulation, and an overpowering amount of secretion is thus produced. In this relation it is very interesting to consider how frequently the disease appears to be started by some mental strain. Severe fright, intense grief, great anxiety, and worry, are common antecedents in the history of those cases, and I have long been impressed by the resemblance of the picture of the person suffering from intense fear to that of the patient with exophthalmic goitre. Under the influence of fear the eyeballs start forward, the upper eyelids are elevated, and the eyes are fixed on the object of terror. The heart at the same time beats quickly and violently, so that it can be felt palpitating against the ribs. The limbs tremble; the skin breaks out into a clammy sweat; the face and neck are flushed or pallid.

Here we have the symptoms of exophthalmic goitre acutely produced, and there is no reason to suppose that the thyroid gland has anything to do with the condition. But it is interesting to observe that sometimes, under the influence of great excitement and overexertion, a fullness or swelling of the neck occurs. Professor Kocher has suggested that an increased metabolism in the nervous system, such as might arise from sudden or prolonged nervous exhaustion, produces toxic substances which, when they reach the thyroid gland, stimulate it to increased activity. This seems to me very probable. At any rate, it is a plausible explanation of the relationship of emotional disturbance to the changes we meet in the thyroid gland.

Before going further it is highly important that we should take notice of the relationship of another gland, namely the thymus, to exophthalmic goitre. The presence of a persistent and often much enlarged thymus gland is a very frequent feature of the disease. In all the fatal cases I have myself had an opportunity of examining it was present. But I am no longer entitled to state that an enlarged thymus is always present, for in one case examined at St. Thomas's Hospital the thymus was found to be atrophied. This case, however, was one of already seven years' duration when the fatal termination came. In some of the cases the enlargement of the thymus has been very considerable, the gland sometimes weighing as much as 3 oz. The enlargement of the thymus in exophthalmic goitre has long been recognized as a feature of the disease. It should also be noted that hyperplastic swelling of the cervical and bronchial lymphatic glands and of the lymphatic structures of the intestines and enlargement of the tonsils have also been noted in fatal cases. Now what is the relationship of the enlarged thymus to the disease is difficult to explain, but that the relationship is a very close one is obvious, and it has a very important bearing on the surgical treatment of the disease.

Of recent years attention has been frequently directed to a condition designated status lymphaticus, or lymphatism—a condition characterized by hyperplasia of the thymus and of the lymphatic tissue generally throughout

[15] The *Lancet*, Clinic for 1910.

the body, and also by hyperplasia of the heart and of the arterial system. It is found in a large number of otherwise unexplained cases of sudden death. Its cause is quite unknown. Like exophthalmic goitre it is occasionally found in several members of the same family. It has been found in a number of cases of death under anaesthesia. The condition is unsuspected during life. In some of the cases reported as examples of this condition it has been noted that the thyroid was enlarged, but this has not been the rule.

I believe, however, that the status lymphaticus really underlies many cases of exophthalmic goitre. It is this condition of lymphatism which contributes so largely to the immediate risk to life from operation in exophthalmic goitre. Most of the cases of death from operation occur during or shortly after its performance. As yet I do not know of any case where this quickly fatal result has occurred and an enlarged thymus has not been found. I may say here that the immediately fatal result of operation in several of my own cases has had a strong deterrent effect on me as regards resorting to surgical treatment. Within the last few weeks another case under one of my colleagues has ended fatally while the operation was in progress, and in this also the condition of lymphatism was found to be present.

It will be gathered from what I have already said that while I am prepared to admit that the hypertrophy and overactivity of the thyroid is responsible for the main symptoms of the disease, I do not consider it is, like the atrophy of the gland in myxoedema, the *fons et origo* of the disease. Therefore, theoretically I do not expect that removal of the goitre or part of it will cure the disease. But I am quite willing to be convinced by results. Personally I have seen no cases that I should consider cured by operation.

Our results at St. Thomas's have been as follows: Thirteen cases have been operated on; of these, 5 were improved, 3 remained *in statu quo*, and 5 terminated fatally as the result of the operation. Of the cases improved 2 had no exophthalmos thoughout; in the other 3 the exophthalmos did not appreciably diminish after the operation, although the pulse became quieter. One of my cases which was unimproved was operated on sixteen years ago, and was of old standing at the time of the operation. I saw her recently; her eyes were as prominent as ever and her tachycardia still remained, but there was no evidence of any remaining thyroid enlargement. She came to see me because recently she had developed diabetes. It may be said that these cases are too few to entitle one to pass judgement on operative treatment. But the results are certainly discouraging, and incline me to persevere with medical treatment.

By far the best published results are those which have been given by Professor Kocher himself. I congratulate him, but I cannot believe that he gets the same kind of cases to operate on as we do here. The results of operations recorded by Rehn, Mayo, and Schulz show a much higher rate of mortality. For the severe cases Rehn notes that the mortality was as high as 22 per cent. A large proportion of cases operated on abroad appear to be of the slighter forms, which are also amenable to medical treatment.

When we come to compare the results, the cases treated medically compare very favourably with those treated surgically, if we exclude those of Professor Kocher. Among hospital patients 36 per cent. recover completely or almost completely, and not more than 25 per cent. are observed to terminate fatally. But among private patients the results are much better. We are advancing in our knowledge of the disease, and I think our medical treatment is becoming more successful. I believe it is a disease for which we shall find a medical cure. The disease depends on the presence of a poison circulating in the blood, and I do not despair of an antidote to this poison being discovered. I hold that in cases of a serious type the risk from operation is too great to make it justifiable, while in cases of a mild type I do not think the results are sufficiently good to make one advise operation.

DISCUSSION.

Dr. H. A. Bruce (Toronto) said he had hoped to be able to report a small series of cases without a death, but although his first twenty cases recovered the next two died—the first from pneumonia on the sixth day; the second died of shock in sixteen hours, and showed *post mortem* an enlarged thymus gland. The speaker had been able to follow up most of these cases, and 14 of them were cured, 5 so much benefited as to be able to resume their usual work, and 1, although relieved at first, had recurrence four months after, and would require ligation of vessels of the opposite side. While the speaker was operating on a case of ordinary simple goitre, the patient suddenly stopped breathing and died on the table. The *post-mortem* examination showed the status lymphaticus. McWilliams had recently collected 1,055 cases of Graves's disease operated on by Kocher, Garré, Mayo, Crile, and other well-known Continental and American surgeons, with a mortality of 4 per cent. Garré collected over 500 cases giving the ultimate results. He found 16 per cent. of absolute cures and 85 per cent. of such marked improvement that the patients were able to resume their usual occupations and live a normal life. This should answer Dr. Hector Mackenzie's statistics of cases under medical treatment and showing 36 per cent. of recoveries. Professor Kocher and many Continental surgeons used, it seemed, a local anaesthetic, but the Swiss must have a very different nervous constitution from patients in Canada, where the speaker had not been able to operate successfully under a local anaesthetic. He had adopted the method devised by Dr. Crile of operating without the patient's knowledge. This followed his observation that psychical excitation caused an acute attack from a discharge of secretion from the thyroid gland into the circulation. It worked admirably in all his cases and he very strongly recommended its use. He might also say that he always used ether as an anaesthetic given by the open method.

Mr. George Heaton (Birmingham) said it was well to keep in mind that it was still an open question whether the symptoms of exophthalmic goitre were due solely to an excessive thyroid secretion or to perversion of the action of that gland—in other words, to hyperthyroidism or an "aberrant" thyroidism. If the first view were correct, removal of the source of excessive secretion must almost necessarily be followed by a cure of the symptoms; but if these were due to a perverted secretion, cure might not so certainly follow if any portion of the gland were left behind. In some of the worst and most acute cases of Graves's disease, the general symptoms occasionally appeared before any goitre was noticed. Then, again, the size of the goitre had certainly no fixed relation to the severity of the patient's symptoms; in more than one fatal case he had seen the goitre entirely disappear before the end.

These clinical facts and the microscopic appearance of portions of the gland after removal (which, with its acini full of rapidly proliferating epithelium, and with almost complete absence of colloid material, in no way resembled an ordinary hypertrophied organ), were very much against the disease being a pure hyperthyroidism. It was also a singular fact that in a very large percentage of the fatal cases of Graves's disease, there was found *post mortem* a great enlargement of the thymus gland, and often a general lymphatic enlargement. Their appearances resembled somewhat closely those found in the so-called "status lymphaticus," and formed only one of the many points of resemblance between the two diseases. In considering the operative risks of Graves's disease it must be borne in mind that many cases of ordinary parenchymatous and cystic bronchoceles exhibited some symptoms of hyperthyroidism. They were often mistaken for cases of true Graves's disease, and, in fact, were regarded as such by some surgeons. The speaker did not take this view, and thought they should be kept in a separate class.

Such cases were numerous, and the operative risk was infinitesimal. It was the inclusion of such cases in statistical lists of operations that had given rise to such divergent views as to the risks and dangers involved.

In true cases of Graves's disease the danger of the operation lay in delay. In the quite early stages of the disease the risk of excision, though greater than in simple goitres, was comparatively small, but at this stage unfortunately the surgeon seldom saw them. If the disease was not arrested or the symptoms much improved after a few months' trial of purely medical measures—including as

factors of prime importance complete rest of body and of mind from all sources of worry and excitement—operation should be advised. At this stage removal of one lobe of the gland would, as a rule, cure the patient, and the operation was only slightly more serious than in the ordinary variety of goitre. When the symptoms had been in existence for a considerably longer period and were slowly progressive, or when, as so frequently happened, the patient relapsed as soon as a strict regimen was relaxed, operation might still be advised. But the risks were now much greater, and must be fairly put before the patient; it was no longer possible to promise a cure, though great improvement might be expected. Here the choice must be made between excision of one lobe, as before, or if the case was too severe of ligaturing one or more of the thyroid arteries in turn, with excision, after an interval, if the patient was not cured or considerably improved. Of such cases the speaker had had one or two brilliant cures, and a larger number of modified successes, and one death. The fatal case followed simple ligature under a local anaesthetic in an acute case. He chose his cases, however, most carefully, and refused more frequently than he consented to operate.

The third class was the advanced or extremely acute cases. These were the ones that the surgeon was most frequently called upon to see. All else had failed; the patient was rapidly going downhill; the tachycardia, restlessness, and nervous symptoms were intense, and diarrhoea and vomiting, with pyrexia, were often present. Such cases the speaker would never touch, and he believed that the majority of operators took the same course. Any operative procedure whatever was almost certainly followed by disaster; the shock of any traumatism would prove fatal. In respect of anaesthesia he held that unless there was evidence of cardiac degeneration and much dilatation—when no operation at all should be done—a general anaesthetic was to be preferred, and did not add to the risk, but rather minimized it. It enabled the operator to perform his work more rapidly, with greater ease and comfort to himself, and so with greater dexterity.

Mr. Robert Campbell (Belfast) said that before a profitable discussion could be held on the subject the cases should be divided into primary and secondary exophthalmic goitre. The former class included those that were most prone to a fatal issue after operation, and it would be advisable to restrict the discussion to these cases. Personally he had operated on 6 cases of primary exophthalmic goitre without a fatality. In all the cases excision of one lobe of the gland was the operation performed. Three cases had rapidly and completely recovered. One was relieved, but the symptoms persisted to such an extent that the patient was unable to follow her occupation; excision of half the other lobe was then performed, with complete and permanent relief. Another case had gradually improved, but at the end of a year she could not yet be said to be free from symptoms. Another case illustrated Dr. Kocher's view as to the influence of sea air, the patient after recovering completely having developed in a mild degree a recurrence of symptoms. In his first 3 cases the speaker used local anaesthesia, but afterwards adopted ether and morphine, with which he had every reason to be satisfied. His experience made him a strong supporter of operative treatment.

Mr. Robert Kennedy (Glasgow) said that, after excision of one half of the thyroid gland in Graves's disease with extreme exophthalmos, he had noticed a tendency within a few days for the protrusion of the eyeball on the side of operation to be distinctly less marked than on the other side. Possibly this was due to the affected thyroid gland causing a direct irritation along the sympathetic, and in this way acting as a contributory cause of the exophthalmos. After removal of one side of the gland, there may thus be a diminution of that irritation, and therefore a tendency for the eyeball to recede somewhat. After excision of the cervical sympathetic, there was always in the speaker's experience recession of the eyeball; it was very noticeable when only one side had been dealt with, and less so by reason of the symmetry when the operation had been done on both sides. Hence in the photographs, such as those of Jaboulay, which had been produced as showing the improvement in the exophthalmos following such operations, the improvement might be more apparent than real. The dangers of excising half or more of the thyroid had been exaggerated, but general anaesthesia ought certainly to be avoided, more especially as local anaesthesia worked so satisfactorily. Recently he had given up β eucaine in favour of cocaine; $\frac{1}{4}$ grain of this was quite sufficient to enable a very large lobe to be painlessly removed if the cocaine used was sufficiently diluted, say $\frac{1}{2}$ grain in 100 m of water. Pyrexia, up to 102° F., after the operation was quite unassociated with sepsis. It occurred, if at all, in the first forty-eight hours, and the wounds showed no indication of sepsis, and healed normally. He always, however, left a drain at the lower angle. Probably the pyrexia was due to absorption of substances from the gland. It was not necessary, however, to suppose with Rehn, Möbius, and Reinbach, that post-operative deaths were usually due to acute poisoning by absorption of the substances, as in the vast majority of cases these deaths were due to the condition of the heart. In very acute cases presenting marked cardiac dilatation and possibly gastric symptoms, he delayed operating until they had been brought into a more suitable condition by medical and hygienic treatment. In every case appropriate medical treatment should undoubtedly precede operation, and in these particular cases an operation without preliminary preparation would be more than likely to prove fatal.

Mr. Gilbert Barling (Birmingham) thought that cases of Graves's disease coming to the surgeon should be divided into two groups: (1) those who suffered in the first instance from ordinary goitre, and in whom eventually the nervous phenomena of Graves's disease supervened; (2) those in whom the nervous symptoms predominated from the first, the condition of the thyroid gland attracting, at all events from the patient, little attention. He had operated in several of the first group by excision of half or more of the enlarged thyroid; all the patients had recovered, and there had been almost immediate relief to their symptoms, so that they could return to their ordinary life. The cases in the second group were always sources of the greatest anxiety. He had confined his operations in these to ligation of arteries, sometimes ligaturing two, at others three, arteries at different times. In nearly all the patients operated on relief had been given, so that life was made tolerable and useful; but he had to mention three deaths. In all of these the symptoms were very severe and steadily progressive; they were just the cases most needing help from operation, as they were going steadily, and in two instances rapidly, to the bad. The first was a woman aged 35, in whom both superior thyroids were tied under choloroform anaesthesia; she died the same day with rapidly increasing excitement and quickening pulse. The second was a woman aged 50, in whom both superior thyroid arteries were ligatured under eucaine anaesthesia. The patient died on the sixth day with thrombosis of the whole length of the right femoral artery, a curious occurrence in the light of the observation by Professor Kocher that in Graves's disease there was diminished coagulability of the blood. The third patient was a nurse aged 23, whose symptoms came on very acutely, and who, after abstaining from work for a few weeks, unfortunately then returned to her duties and went rapidly to the bad. Both superior thyroid arteries were tied under morphine-scopolamine-ether anaesthesia, and the patient died in a few hours, with excitement, rapidly increasing pulse, and probably oedema of the lungs. The importance of complete rest in bed for some time before operation could not be too strongly pressed. Even when this was insisted on, and whatever method of anaesthesia was used, operation in these very severe cases—the cases, above all, for which they had little other therapeutic resource—would always convey a large element of risk.

Mr. Donald Armour (London) said that his remarks would be based entirely upon his own operative experience in some 20 odd cases, with 1 death. He had never refused to operate on a case, but had invariably insisted that the diagnosis of exophthalmic goitre should be confirmed by one or more of his medical colleagues. He had experience of two operative procedures—namely, tying of arteries and excision of one lobe or more of the thyroid gland. After his first 6 cases he abandoned the tying of arteries, and

now only performed it in cases where the larger operation was contraindicated, as a preliminary to a later excision of a part of the gland. While the tying of arteries was a safer operation than excision, it was not so effective, and, moreover, might be more difficult. With the exception of his first case, when local anaesthesia was used, he had invariably used chloroform given by the Vernon Harcourt method. Twenty minutes before the operation the patient had a hypodermic injection of ¼ grain of morphine and from $\frac{1}{75}$ to $\frac{1}{100}$ grain of atropine. Either during the operation or immediately following it the patient had a continuous saline administered subcutaneously or by the rectum. He laid great stress upon the manipulation of the gland during operation, as he regarded any rough handling or swabbing as distinctly dangerous, and therefore to be studiously avoided. He used drains now less frequently than at first. In respect of results, his first 12 cases were investigated by Dr. Alfred Warren, who used them as a basis for his M.D. thesis at Cambridge. These were taken because they had been performed sufficiently long ago to enable one to come to a definite conclusion as to the result of operation. Dr. Warren found that all cases had improved as the result of operation, some having completely recovered, one or two having since married and borne children. The one death was a case which should not have been operated upon. The patient was extremely emaciated, had persistent diarrhoea and vomiting, and occasional hallucinations. She had been abandoned by the physicians as a hopeless case, and it was only at the earnest solicitation of her relatives that the speaker agreed to operate as a last resource, after fully explaining the risks. The patient died just after the completion of the operation.

Mr. E. DEANESLY said that there existed not merely all grades of severity in cases showing the classical symptoms of Graves's disease, but various transitional cases between the perfect clinical picture and cases of simple goitre without symptoms. Speaking generally, the symptoms of hyperthyroidism were in inverse proportion to the number and size of the adenomatous masses, or, rather, were directly related to the amount of hypertrophied or perverted gland substance which remained. Hence the formation of adenomata might be regarded as a natural curative or protective process. If this pathological conception was correct, the removal of a sufficient amount of the enlarged and altered gland should bring about an amelioration or cure of all cases of goitre accompanied by symptoms of hyperthyroidism, including those severe forms which presented the classical symptoms of Graves's disease. The experience of surgery at the present day was in harmony with this conclusion, and it was impossible to doubt that exophthalmic goitre could be cured by excising a sufficient quantity of the affected thyroid gland. The only questions that remained open to discussion, therefore, were the relative advantages of operative and non-operative methods of treatment in particular cases, and the best means of avoiding the risks and difficulties of the operations, and of ensuring a successful result. As to the first question, much depended on the natural course of the disease. Was the usual tendency towards recovery or the reverse? That many cases run a fairly prolonged course was incontrovertible. That some cases might be ameliorated by various non-operative means was equally beyond dispute. Nevertheless, complete recovery, either spontaneous or assisted by medical means, was rare, and a majority of severe cases proved fatal within a few years. The remainder were more or less invalided and did not live their full term of years. That, at any rate, was his own impression. As to the dangers of the operation, the mortality was high in severe cases, though even in these experienced operators showed greatly improved results. In cases presenting all the classical symptoms in a mild form the fatality of operation was no longer great, and in those transitional cases in which an ordinary goitre was associated with some only of the classical symptoms the fatality was little more than that of operating for simple goitre, or not more than 1 or 2 per cent. The risks of general anaesthesia had been exaggerated by some. Except in very advanced cases with organic changes in the heart, general anaesthesia was preferable. He had no experience of ligaturing the arteries without removing a portion of the gland, but had always removed the larger lateral lobe together with the isthmus. In some cases he removed two-thirds or three-quarters of the whole gland, taking care to avoid ligaturing either the superior or inferior artery on one side, and always leaving a small portion of gland at the entrance of the inferior artery on the side from which the whole lobe was taken. By this means one avoided ligaturing the main trunk of the inferior thyroid and endangering the recurrent laryngeal nerve. Incidentally this also preserved the arterial branch of the parathyroid on that side, though he was not yet convinced that that fact was of importance. Within twenty-four hours his patients had always expressed themselves as feeling much better than before. The pulse, generally greatly accelerated by the operation, had gradually declined, and eventually became normal, or nearly so. Exophthalmos diminished, but in his own experience had never completely disappeared. In other respects complete recovery occurred.

Mr. W. G. SPENCER (London) said that in his experience division of the isthmus by cutting out a small portion and pulling the lobes a little apart had afforded marked relief. Indeed, this operation might be sufficient. The cases in which there was marked parenchymatous enlargement might require removal of more than the isthmus. A girl sent up by Dr. Bourns, of Oxted, had portions removed at four operations before she was sufficiently relieved. By thus doing limited operations he had escaped fatalities. Other cases in point were as follows:

1. An unmarried woman, aged 25, had been under the care of Dr. de Havilland Hall for some years. She had marked exophthalmos, was very anaemic, and had a pulse-rate of 130 whilst in bed. The thyroid gland was not enlarged. The isthmus was divided under superficial anaesthesia, and when she left the hospital the pulse was 90. Nine months later she was asked to come up to the hospital, but replied that she was so well as not to need further treatment.

2. The patient, a pale, thin young woman, had had seven years before an enlargement of the thyroid, which had gradually got smaller and harder, and with it difficult breathing had supervened. The thyroid gland felt of normal size and shape, but of almost stony hardness. There was marked stridor; the pulse was 130 to 140. The isthmus was cut through and a piece excised; it was of the texture of the hardest fibrous tumour. The trachea had been markedly constricted, uniformly, not laterally, compressed. When the trachea was incised just below the cricoid cartilage, it seemed to be narrowed below to a mere chink. The trachea was, therefore, divided longitudinally through the constriction and a tracheotomy tube inserted. The tube was kept in for a fortnight; the wound had healed at the end of a month. Six months later there was no respiratory difficulty, but a little stridor could be heard. The pulse was still 120 per minute. Later on she developed signs of myxoedema, and attended hospital for some years for treatment. A slight stridor was always present.

3. In the following case it was necessary to remove the sympathetic ganglia at separate operations. A single woman, aged 32, under the care of Dr. Murrell and Dr. F. Norman, had not been relieved by medical treatment. The thyroid gland was not obviously enlarged, but there was a fullness in the neck on each side which suggested an enlargement of the sympathetic ganglia. She was in much distress; the night before the operation she spent sitting up in bed and crying. The pulse-rate was 130, with little tension. The isthmus was excised as quickly as possible; microscopically nothing abnormal was noticeable. The pulse-rate receded, to be not more than 90 at any time; she improved in health, and slept well. After a time attacks of pain started in the left eyeball; it was of a burning character, with throbbing pain in the left temple. As this could not be relieved, three years after the division of the isthmus the left upper cervical ganglion was excised and the sympathetic nerves dragged out. The sections of the sympathetic ganglion did not show on microscopical examination anything but what has been found in these ganglia without sympathetic disturbance. For three months she remained without pain, then similar attacks started in the right eye. There was burning pain at the back of the eyeball, throbbing pain in the right temple, a feeling of muscular contraction, a flushing of the face, and flow of tears. The attacks came on during her first sleep, and kept her awake for hours. Drugs did not relieve, and the right sympathetic ganglion and nerves were excised; nothing distinctly abnormal could be seen on histological examination. A year after this third operation the eyeballs were prominent, but the sclerotic did not show below the upper lid; she had a pulse of 90. She slept all night. She could ride a bicycle for twenty miles without getting tired. She had had no more pain. About a year ago she complained of severe attacks of palpitation; whilst in bed and carefully dieted she presented no abnormal symptoms.

Mr. THELWALL THOMAS (Liverpool) said that after an early experience, many years ago, of the dangers of chloroform anaesthesia in exophthalmic goitre, he abandoned the

operation and only recently had resorted to it again. Physicians were now realizing that after *short* non-successful medical treatment, surgical interference ought to be resorted to. Under open ether anaesthesia results were now very good in the severe types of true exophthalmic goitre. This type appeared to be rare in comparison with the cases of general goitre. The last series of cases operated upon by the speaker had recovered.

Mr. Hey Groves (Bristol) mentioned treatment of exophthalmic goitre by grafting normal thyroid tissue after excision of the diseased gland. He maintained that in many cases there were three different factors in the causation of the disease, namely, (1) an excess of certain elements of thyroid secretion, (2) the presence of abnormal thyroid secretion, and (3) the absence of certain elements of normal thyroid secretion. It had already been remarked by previous speakers that a fairly large proportion of those operated upon for exophthalmic goitre made only a partial recovery. The view was urged that in many such cases a more complete removal of the diseased thyroid followed by multiple grafts of the healthy human gland would produce a more thorough cure. Evidence of this was adduced by briefly referring to a case of a girl who had had a subtotal thyroidectomy for severe exophthalmic goitre. She developed severe tetany and other signs of thyroid insufficiency, but the dyspnoea and tachycardia persisted, whilst the exophthalmos was cured. But after grafting both parathyroid and thyroid tissues directly from another patient (operated upon for thyroid adenoma) her condition showed much more marked improvement than that which occurred after the thyroidectomy. Details of this case and a review of the subject named will be published later.

A METHOD OF ESTABLISHING COLOTOMY OPENINGS AND PERMANENT URETERAL FISTULAE.

By C. J. Bond, F.R.C.S.,
Senior Honorary Surgeon, Leicester Infirmary.

I think it will be admitted by every one that the personal discomfort which under present conditions is the lot of the patient with a colotomy opening or a ureteral fistula is a very real evil, and must be regarded as a considerable set-off when advising radical operation for the removal of malignant disease of the lower bowel or bladder. Any method, therefore, by means of which we can prevent or minimize this consequential disability and discomfort is well worthy of our serious consideration.

I desire in the first place to draw your attention to the result in operations on the lower urinary tract. Ureteral implantation in the loins or the bowel is practically a necessary part of the operation for radical removal of the bladder for malignant disease. It is, moreover, the only way of relieving the acute suffering which supervenes in the later and inoperable stages of the same disease from the presence of urine in the diseased bladder. In cases of advanced tuberculous disease which have resisted other treatment, relief may also only be obtained by cutting off the urinary flow. Unfortunately the ureteral fistulae so established, in whatever situation, and in spite of considerable ingenuity and variety of mechanical appliance, are still a source of much discomfort to the patient.

It was in connexion with a bad case of extroversion of the bladder in June, 1907, that I was first led to try and establish a raised or teat-like outlet for the mucous canal of the ureters, instead of allowing them to open flush with the skin surface, as has hitherto been the custom.

The patient was a female child, aged 5, in whom an unsuccessful attempt had been made previously in another hospital to transplant the ureters into the rectum. Owing to the strictures produced in the ureteral openings, and the resulting urinary stasis, extensive ascending infection of both kidneys was present, threatening the life of the patient, and I decided to establish permanent ureteral fistulae in the loins, with the hope that the freer drainage so provided might check the renal infection.

Accordingly, on June 11th, 1907, the right ureter was freely exposed in its course along the psoas muscle, and over the brim of the pelvis. It was distended to the size of the forefinger with purulent urine. It was divided after ligature as low as possible, and the proximal end brought out in the right loin in the position indicated in the photograph. A strip of skin about ¾ in. wide parallel with the skin incision was now raised, with its base at the point of exit of the ureter through the abdominal wall. This skin flap was wound spirally round the free end of the ureter, the edges of the spiral were sutured together, and the end of the flap at the summit of the papilla also sewn round

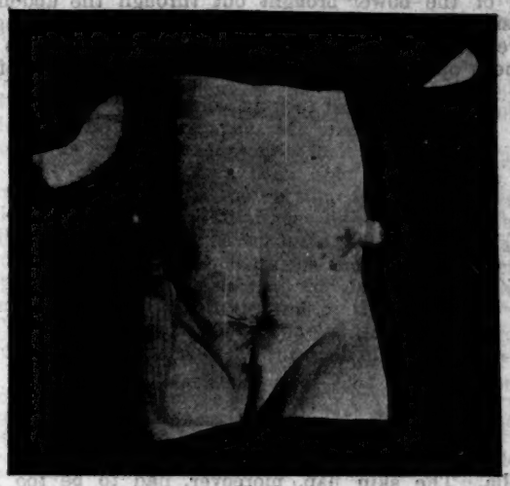

Fig. 1.

the cut end of the tube. In this manner a skin covering was provided for the free 1½ in. of ureter lying outside the abdomen, and the canal thus made to open on the summit of a skin papilla having the ureter running through its centre as a core (Fig. 1).

The left ureter, also distended and infected, was treated in the same way a month later. A Jacques catheter was fixed in either ureter, and the turbid urine collected in bottles, one on either side.

The present condition of the papillae and the ureteral openings is shown in the next photograph, taken three years later. This shows that they have for the most part retained their shape and prominence, though a slight flattening has occurred on the right side owing to a slough of a small portion of the skin flap (Fig. 2).

Fig. 2.

A special form of lumbar urinal was then devised (Fig. 3). This consists of a rubber belt with two hollow cups with inner flanges which fit over the papillae, and which drain by rubber tubing into two small rubber reservoirs, one on either side. In this way, provided the instrument is kept carefully cleansed, the child is enabled to get about in fair comfort, and now attends school.

One word about the effect on the renal infection of the shorter and more direct urinary outflow established by the operation. A gradual improvement in the condition of the urine collected by ureteral catheter from each kidney was noticed soon after the operation. Advantage was taken of the ready access to the kidney pelvis to wash out each organ daily for a time, but this did not seem to make much difference in the condition of the urine, which gradually improved after the relief of the urinary stasis. From the experience of this and other ureteral cases I was led to extend the principle of the raised or papillary opening, with certain modifications to colotomy openings and the artificial anus. A difficulty in the case of the bowel arises from the fact that it is necessary to provide a much more ample skin covering to allow of

Fig. 3.

the varying condition of distension of the bowel tube. I found that the spiral skin flap wound round that portion of the bowel brought out through the abdominal incision was not satisfactory. It necessitated dividing the bowel across at the operation and providing for the permanent opening of the distal portion to one side of the

Fig. 4.

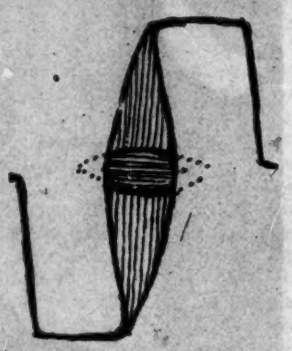

Fig. 5.

papilla. The skin flap, moreover, had to be too long. Hence a different method was adopted.

A transverse incision is first made through the skin of the abdomen with its centre at the point at which it is desired to bring out the loop of descending colon through the abdominal wall (Fig. 4).

The edges of this skin incision are fully retracted, and a vertical incision is made through the abdominal wall at right angles to the skin incision. A loop of colon of appropriate length is then drawn through. If the mesocolon is short, it may be necessary to liberate this partly at the reflection to the parietal peritoneum, in order that a loop of bowel some 4 in. in length may lie outside the abdomen without tension. It is also desirable to approximate the two arms, distal and proximal, of the loop by two or three sutures passing through the mesenteric border of each segment; in this way a parallel double tube is formed.

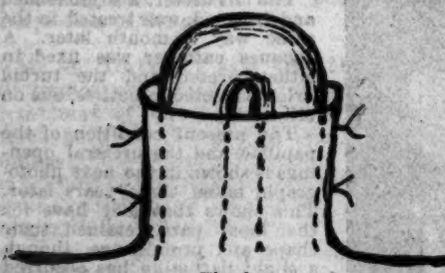

Fig. 6.

Fig. 7.

The next step is to clothe this loop of bowel with skin. Two rectangular skin flaps are marked out, one on either side of the original transverse skin incision (Fig. 5). A terminal incision starts at each end of this first incision, and is carried at right angles to it for about two inches; it then turns back at right angles, and is carried parallel to the first transverse incision to a point opposite its centre. The two rectangular skin flaps so included are now raised and hinged back, one on each side to the middle line of the transverse incision. These flaps are now applied to the two sides, inner and outer, of the bowel loop by undermining and approximating the sides of the transverse incision.

The skin flaps (*Fig.* 6) are then sutured together round the bowel, and it is best to suture the lower or

Fig. 8.

under edges first, in order to secure the union of the skin round the bowel on its lower side, as if there is much

Fig. 9.

tension the upper edges may be left unsutured, without much disadvantage to the result, provided the base of the

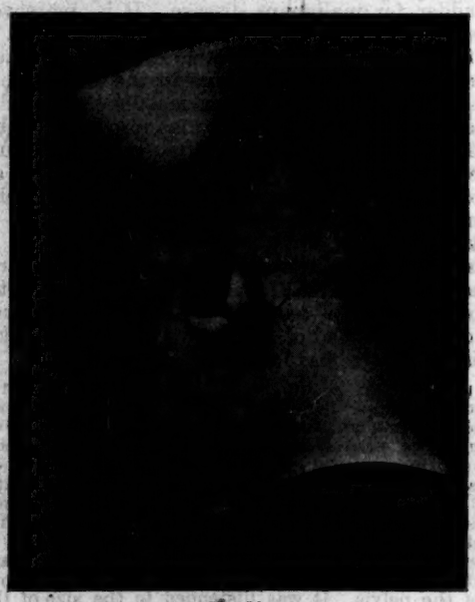

Fig. 10.

flaps are approximated. The square ends of the skin flaps are then lightly sutured to the bowel coat on a level with the mesenteric angle, so that when the bowel is

opened on the summit of the papilla a few days later there will be a good eversion of the mucous coat on either side resulting in a well-everted and patent muco-cutaneous stoma.

It is important to delay opening the bowel for some days if possible in order that primary union may take place between the skin flaps and the peritoneal surface of the bowel and between the sutured skin edges. In this way cicatricial contraction is prevented. If it should be necessary to open the bowel at the time of operation a glass tube should be tied in.

Figs. 8, 9, and 10 show the after-results—the teat-like colotomy anus so formed taken at varying intervals after operation in both male and female patients.

Fig. 7 shows the colotomy belt specially made to fit over the papillary anus.

One word in conclusion concerning the advantages, immediate and remote, which we may, I think, look for by this method of performing colotomy. From my own experience of the removal of the lower bowel for malignant disease, and from observation of cases operated on by other surgeons, I have learnt to regard any attempt to restore the continuity of the bowel by anastomosis, after the removal of cancer of any considerable portion of the lower rectum involving the sphincter area, as inadvisable.

The thought of the subsequent junction of ends has an inhibiting effect on the surgeon's mind. It tends to prevent a sufficiently free and wide removal of bowel and meso-rectum. It is very desirable that the whole of the upper area of disease should be attacked and freely exposed from within the abdomen, and the lower outlet and sphincters where necessary removed by a combined abdomino-perineal route. The whole sacral concavity can thus be swept clear of its lymphatic contents. Malignant disease of the lower sigmoid colon and rectum should, in fact, be dealt with on the same lines on which we now deal with cancer of the uterus—namely, by hysterectomy on the lines laid down by Wertheim.

In the former, as in the latter case, the structures in the pelvis should be freely exposed to view, and facility obtained for identifying, and if necessary isolating, the ureters and other important structures, and for removing the whole lymphatic area. This can only be carried out satisfactorily after a preliminary and permanent colotomy has been performed.

I am not without hope that by the method I have just described, or by further improvement of it, we may be enabled to render the daily lives of patients condemned to permanent colotomy much more comfortable. By thus more readily reconciling such patients to a state of things which has hitherto involved very serious disability, we may minimize one factor which has considerably retarded the progress of the efficient and radical surgical treatment of cancer of the rectum.

THE RADICAL ABDOMINO-PERINEAL OPERATION FOR CANCER OF THE RECTUM AND OF THE PELVIC COLON.

By W. Ernest Miles, F.R.C.S.Eng.,

Surgeon to the Cancer Hospital and to the Gordon Hospital for Diseases of the Rectum.

For several years past I have been struck by the great frequency with which recurrence follows perineal operations in the surgical treatment of cancer of the rectum and of the terminal portion of the pelvic colon. Indeed, my personal experience tends to show that it is a rule to which there are few exceptions, especially if the patients are kept under observation for several years afterwards. By perineal operations I mean any operation undertaken from the perineum and not some particular procedure such as is often described in textbooks under the head of perineal excision. Used in this generic sense perineal operations include excisions effected by the various methods of exposure such as Kraske's, Bardenheuer's, and the like.

It seemed to me that this frequency of recurrence was due to some fault in technique and in a too great conservatism in the removal of the tissue surrounding the diseased portion of the bowel. Consequently I made observations upon the spread of cancer from the rectum, and carried out the investigation under the following heads—namely, (1) the progressive spread of the disease in inoperable cases from the clinical aspect; (2) the *post-mortem* findings in patients who had died from inoperable cancer of the rectum; (3) the evidence of spread of the disease in the tissues surrounding the bowel observed during the performance of operations; and (4) the localities in which recurrences took place after excision.

In this way I have been able to determine that a cancerous growth in the rectum spreads in three directions, and invades the tissues either in the nature of a direct permeation, or as separate metastases; at any rate so far as naked-eye appearances show. The directions of spread are downward, lateral, and upward, and take place in the zones of tissue traversed by the lymphatic vessels. Thus we may speak of the zone of downward spread, the zone of lateral spread, and the zone of upward spread.

The Zone of Downward Spread.—The tissues in this zone consist of the wall of the bowel below the growth, the external sphincter muscle, the perianal skin, and the fat contained in the ischio-rectal fossa.

The Zone of Lateral Spread.—This comprises the levatores ani muscles, the fascia propria of the rectum, the pre-sacral connective tissue, and its contained lymphatic glands. In the male the capsule of the prostate gland, the vesiculae seminales, and the base of the bladder; and in the female the posterior wall of the vagina, the cervix uteri, and the base of the broad ligament with Poirier's gland.

The Zone of Upward Spread.—This consists of the bowel above the growth, the pelvic peritoneum, the pelvic mesocolon, particularly the border attached to the pelvic parietes with the adjacent peritoneum and the lymph nodes situated at the bifurcation of the left common iliac artery.

It is my object in this paper to show that the tissues contained in these three zones of spread are vulnerable to recurrence in any case of cancer of the rectum and of the terminal portion of the pelvic colon irrespective of the situation or the extent of the growth. For this purpose I shall deal mainly with my fourth line of investigation and set forth the inferences to be drawn from the post-operative recurrences, because it seems to me that this is of the most practical use to the surgeon.

I have made use of only those cases of recurrence which have occurred in my own practice, and have arranged them into five classes showing the types of operation I performed during the periods indicated by the dates of the operations. In my earliest cases, having but scanty knowledge of the spread of cancer from the rectum, I made many mistakes in fashioning my operative procedure, but these served a useful purpose and enabled me to extend the scope of the operation in order to include in each subsequent series those tissues which seemed most vulnerable to recurrence. Thus it will be seen that each series is an advance in that respect upon the preceding, and the whole may be regarded in the light of the gradual evolution of the operation which forms the basis of this paper, namely, the radical abdomino-perineal.

Class I.—In the 9 cases included in Class I, the disease was located in the upper part of the rectum in 2, in the ampulla in 4, and in the lower part in 3. The recurrences manifested themselves comparatively early, the average duration of immunity being twelve months, the shortest time being six months, and the longest eighteen months. The skin and the fat of the ischio-rectal fossa proved themselves to be the most vulnerable tissues, one or other of them having been involved by the secondary growth in all but one instance. In this series of operations, therefore, it was evident that two serious mistakes had been made—first, that the skin had not been removed widely enough; and, secondly, that the ischio-rectal fat had been imperfectly dissected away.

Class II.—In the next series of cases I remedied these faults by removing the skin widely, and by dissecting away as much of the ischio-rectal fat as possible. Of the 14 cases contained in this series, the skin and ischio-rectal fat were implicated by the recurrent growth in 2 only. In one of these the skin was involved by the primary growth, and in the other the growth was extensive and had implicated the posterior wall of the vagina. In the remaining 12 the recurrent growths were situated at a somewhat higher level, the vulnerable tissues being the levatores ani, the prostate gland, and the base of the bladder. The position and the extent of the primary growths were similar to those in the preceding series, and therefore it can be safely assumed that the removal

of the skin and the ischio-rectal fat checked the recurrence so far as the downward zone of spread was concerned. The duration of the period of immunity from recurrence was about the same as in the preceding series, the longest being seventeen months, the shortest six months, and the average eleven months.

Class III.—In the next series of cases, all were suitable for resection, the growths being situated high up. In all of them recurrence took place early, the vulnerable tissues being the wall of the rectum itself and the fascia propria of the rectum. The recurrence in the wall of the bowel was undoubtedly due to the section having been made too close to the growth.

It was obvious from the study of the recurrences in this and the preceding class that the vulnerable tissues should be widely removed, and consequently I determined in the next series of cases to extirpate the levatores ani completely together with the connective tissue lining their upper surfaces; to dissect away the fascia propria of the rectum and as much of the pre-sacral connective tissue as could be reached; to remove the capsule of the prostate gland when the growth involved the anterior wall of the rectum; to open up the peritoneal cavity, and to divide the bowel 3 in. above the uppermost limit of the growth.

Class IV.—Of the 11 cases included in Class IV in which the foregoing measures were carried out, only 2 recurrences took place in the region of the lateral zone of spread, all the others occurring in tissues situated above the field of operation. The vulnerable tissues in these cases were the wall of the pelvic colon, the peritoneum, and the pelvic mesocolon.

Class V.—It was necessary, therefore, in the next series of cases to extend the operation still further, and consequently I decided to remove as much of the pelvic colon and its mesocolon as could be reached. Of the 16 cases contained in this series, only 3 recurrences took place in the lateral zone of spread, all the others occurring above the field of operation, in the pelvic mesocolon and the pelvic peritoneum.

It is interesting to note that in the last two series the period of immunity from recurrence was considerably lengthened, several of the patients not having exhibited any signs of recurrence for over two years, while in 1 case thirty-seven months had elapsed. Moreover, the detection of early recurrence was due in several instances to the fact that the pelvic mesocolon could be palpated by the finger introduced into the lower opening of the colostomy. In some of these instances these early growths could not be palpated through the abdominal wall for several months after they were known to exist. Consequently, if colostomy had not been performed in these cases, a much longer period of immunity would probably have been surmised.

A careful study of the cases of recurrence in all these classes brings out the following points:

1. That a growth in the rectum, wherever situated, may lead to recurrence in the tissues comprising the zone of downward spread.
2. That a growth in the rectum, wherever situated, may similarly lead to recurrence in the tissues comprising the zone of lateral spread.
3. That a growth in the terminal portion of the pelvic colon may lead to recurrence in both the zones of downward and lateral spread.
4. That free extirpation of the tissues comprising the downward and lateral zones of spread generally prevents recurrence in the field of operation.
5. That, however free the extirpation of the tissues comprising the downward and lateral zones of spread may have been, recurrence will in all probability take place among the tissues of the zone of upward spread.
6. That the most complete and extensive perineal operation possible is, with few exceptions, quite inadequate for preventing a recurrence of the disease.

Up to the end of the year 1906 I had performed 59 perineal excisions, with 1 death, which, from the point of view of mortality was quite satisfactory, but, of the 58 patients who recovered, 54 are known to have suffered from recurrence. Of the remaining 4, 1 died seven years after the operation from some intercurrent disease and 3 remain well and are free from recurrence.

Such an experience as the above decided me to abandon perineal methods of excision and to rely solely upon an abdomino-perineal procedure. I therefore designed an operation which would enable me to extirpate the whole of the tissues comprising the zone of upward as well as those forming the zones of lateral and downward spread, for in this way only could one hope to check the tendency to recurrence. I have now performed this radical operation twenty-six times. These patients constitute Class VI.

Ten of them died within periods varying from twenty-four hours to twelve days after the operation, 1 is still in hospital, 1 left too recently to make any statement about him, 1 died thirteen months after operation without sign of recurrence, and 1 has not been since seen. This accounts for 14 out of the 26 patients. The remainder, 12 in number, are all still well and show no sign of recurrence after periods varying from a few months to over three and a third years. In 8 cases the period is over eighteen months and in 4 it is over three years.

The mere combination of the abdominal and the perineal routes in the extirpation of the cancerous rectum is not necessarily a radical procedure. The object of the combined operation is not so much to facilitate operative manœuvres as to safeguard the patient against the onset of recurrence. Such a desirable end can only be attained by a thorough eradication of all the tissues comprising the three distinct zones of spread. This is the only conclusion that can be arrived at from a correct interpretation of the facts in regard to the localities in which post-operative recurrence manifested itself. In the surgical treatment of cancer of the rectum there seems to be among surgeons a decided prejudice against two things—(1) The establishment of an abdominal anus, and (2) the loss of the natural sphincteric control—and consequently from time to time one sees reported in surgical literature cases in which an operation for cancer of the rectum has been carried out to the exclusion of one or the other or both of these. Some of these operative procedures are most ingenious in their inception and are very skilfully executed, but one hears little of the after-results. It seems to me that if the proximal end of the pelvic colon is left long enough to be brought down to the anus, the greater part of the zone of upward spread is left behind, and consequently there would be greater liability to recurrence than if the whole of the pelvic colon together with its mesocolon and adjacent parietal peritoneum were removed. However, there is room for much investigation on this point, and very valuable information would be obtained if the subsequent histories, extending over a period of at least three years, of patients who had undergone these less radical operations were published.

The radical abdomino-perineal operation carried out on the lines here advocated is one of the most formidable operations in surgery. In its execution, speed in operating is of prime importance. Generally speaking, the operation can be completed in an hour and a half, but it should be borne in mind that every minute that can be saved is of great importance to the patient. In my series of 26 operations, the longest time was one hour and fifty-five minutes, and the shortest one hour and seven minutes.

Preparation of the Patient before Operation.

Every patient with cancer of the rectum, whether the growth is causing stenosis or not, suffers from some degree of intestinal stasis with attendant auto-intoxication. Consequently at least a week should be spent, prior to the operation, in clearing the colon thoroughly. This should be done by mild daily aperients and intestinal lavage. The administration of small doses of salol during this time is also highly beneficial.

If there is decided stenosis of the bowel, and especially when there is evidence of hypertrophy and distension of the colon above the growth, either left iliac colostomy or a temporary caecostomy should be performed two or three weeks previously. Personally I think that caecostomy is the better in these cases. It is less risky, and acts equally well. During this period of preparation the patient should be kept in bed and given a light, easily assimilable diet. On the night before the operation, and again on the morning of the operation, a hypodermic injection of solution of strychnine (miij) should be given.

Method of Operating.

This will be best described in its various stages. The patient should be placed in the high Trendelenburg position and the abdominal cavity opened by a median incision extending from the umbilicus to the symphysis pubis. I think this incision is greatly to be preferred to the one sometimes practised in the left linea semilunaris. The edges of the abdominal wound are then held apart by a self-retaining abdominal retractor, and a

general survey of the pelvic and abdominal cavities is rapidly made. Careful search should be made for small nodules of growth on the peritoneum, or upon the small intestine. In my experience the liver is seldom the seat of secondary deposits, unless there is general dissemination of the disease.

Division of the Colon.—The pelvic colon is now drawn up into the wound, and the distribution of the vessels in its mesocolon noted. A point in the colon is then selected between the distribution of the upper and middle sigmoidal arteries. Two stout silk sutures are then passed round the colon, about half an inch apart, and tied firmly.

Treatment of the Ends of the Colon.—The colon is divided with scissors between the sutures, and then the extremities are invaginated and buried by means of a purse-string suture. The distal extremity should be firmly closed in this way, so as to prevent leakage during the subsequent manipulation of this portion of the bowel. The upper extremity is temporarily laid aside until it is utilized for forming the colostomy just before the abdominal cavity is closed.

The Meso-Pelvic Colon.—The pelvic mesocolon is then divided with scissors directly backwards to within a short distance of the inferior mesenteric artery. The peritoneum on its outer side is then incised and a search made for the left ureter which lies close to and parallel to the inferior mesenteric artery in this situation. When found, the ureter is held to one side by an assistant and then a ligature is passed round the inferior mesenteric artery at a point between the origins of the upper and middle sigmoidal arteries. When the ligature has been firmly tied the remainder of the pelvic mesocolon is divided.

The Pelvic Peritoneum.—The peritoneum is then incised downwards longitudinally on either side of the parietal attachment of the pelvic mesocolon and about an inch away from it. These incisions are extended downwards as far as the recto-vesical pouch when they are continued round the lateral aspects of the pelvic wall to meet anteriorly just behind the base of the bladder. In the female subject the left broad ligament should be obliterated and the left ovary and tube removed. The lateral margins of the peritoneum are now dissected up for some distance so as to serve for the re-establishment of the pelvic floor.

Detachment of Pelvic Colon and Rectum.—As the blood supply has been cut off through ligature of the inferior mesenteric artery, this part of the operation can be proceeded with rapidly, and is practically bloodless. Commencing above at the point where the inferior mesenteric vessels have been divided, all the connective tissue over the bifurcation of the common iliac vessels containing the lymph nodes situated in that position is dissected carefully downwards as far as the promontory of the sacrum. The loose connective tissue plane situated in front of the anterior sacral ligaments is then opened up. By passing the index finger into this space the pelvic mesocolon and the fascia propria of the rectum are readily detached as far as the base of the coccyx. A similar method of blunt dissection is then carried out anteriorly, by which means the bladder is detached as far as the prostate gland. Attention is now paid to the separation of the lateral aspects of the rectum, and it is here that great care must be exercised to avoid injuring the left ureter, which adheres closely to the peritoneum as it skirts the lateral wall of the pelvis. When the left ureter has been defined it should be carefully freed as far as the base of the bladder. On the right side the ureter need not be seen, and if possible should not be disturbed. The dissection is then carried downwards on either side until the upper surface of the levator ani muscle is reached, the lateral ligaments of the rectum, which are recognized as firm vertical bands of fascia, requiring division with scissors. It is important that this separation should be carried down on all sides as far as the points indicated, lest considerable difficulty be experienced when the perineal portion of the operation is in progress.

Re-establishing the Pelvic Floor.—The pelvic colon and the upper part of the rectum which now lies loose in the pelvic cavity is then crowded downwards and covered with a layer of sterilized gauze. The lateral edges of the peritoneum are then brought together. It often happens that although these edges meet posteriorly a considerable gap is left anteriorly. In the male this gap can be readily filled by dissecting up the peritoneum from the bladder, but in the female the uterus itself may have to be utilized for this purpose.

The Colostomy.—An incision through the skin about 1½ in. long is now made about 1 in. internally to the left anterior superior iliac spine. The aponeurosis of the external oblique is then incised, and the fibres of the internal oblique and transversalis muscles are separated until an aperture large enough to admit the index finger is made. Through this small opening the stump of the proximal end of the gut is drawn and fixed in position by two silkworm gut sutures. The end of the bowel need not be opened up until the perineal portion of the operation has been completed.

Closure of the Abdominal Wound.—The toilet of the peritoneum is now made, and two or three pints of saline solution introduced into the abdominal cavity. The abdominal wound is then closed in layers in the usual way.

Perineal Portion of the Operation.

The Trendelenburg position having been dispensed with, the patient is turned over and placed in the right lateral and semi-prone posture. A purse-string suture is then inserted round the anus to prevent escape of its contents.

The Skin Incisions.—A transverse incision is first made at the level of the sacro-coccygeal joint, and from the centre of this a median cut is carried down to a point about an inch from the anus. From the lower extremity of the latter a semi-circular incision is made round the anus on either side, meeting anteriorly at the central point of the perineum. These last incisions should include as wide an area of skin as possible.

The Exposure.—The skin is reflected to the requisite extent on either side and the coccyx is removed. There is no need to cut away any of the sacrum. The remainder of the fascia propria of the rectum is then detached and the interval between the levatores ani muscles are defined. These muscles are then divided as far outwards as their origin from the pelvic wall. The pelvic colon and the rectum are drawn out of the wound, when it will be found the tissues comprising the lateral and downward zones of spread only remain to be divided. This should be done as freely as possible.

[A booklet containing printed tables recording all the important points in the 80 cases discussed in this paper was handed to members of the Section. Copies of it can, we understand, be obtained on application to Mr. Miles.]

DISCUSSION.

Mr. Douglas Drew (London) pointed out the importance of removing the whole of the area along which infection spreads. It was impossible to carry this out thoroughly and at the same time to re-establish the continuity of the bowel. He had done this in 2 cases, but in both a fatal result ensued from sloughing of the rectum. In 2 others he had done the same operation and given the patient a colostomy; these were well more than three years later.

Mr. Lockhart Mummery (London) agreed that the only operation which should be considered now for cancer of the rectum was one involving the total and *en masse* removal of the whole rectum and neighbouring lymphatic area. A colostomy opening for the bowel was not a necessity. By modifying the technique it was possible to restore the bowel and leave the patient with a new rectum formed from the colon, which became entirely satisfactory as regards control and function. In one case of a man upon whom he had operated seven years ago, he formed a new rectum from the colon, over which the patient had most satisfactory control. Most patients in his experience would refuse any operation at all if a permanent colostomy was the best they could be promised. The aim should be to improve and develop the operation and to complete the restoration of function, but the patient should not be left with a permanent colostomy.

Mr. C. J. Bond (Leicester) said it was the increasing necessity for a permanent colostomy after radical operation for the removal of cancer of the rectum, and the great desirability of removing some of the discomfort and disability which attended the establishment of an artificial anus as at present made that had led him to adopt the method just described by him of performing colostomy. If any great advance was to be made in the reduction of the percentage of recurrences after operation for cancer of the rectum it must be by means of a wider and more elaborately planned extirpation of the pelvic colon and the associated lymphatic area on the lines so well laid down in Mr. Miles's paper. In order to bring this about in many cases surgeons must reconcile themselves and their patients to the disadvantages of a permanent colostomy. The operation for the radical removal of cancer of the rectum was at present passing through those evolutionary phases through which the similar operation for cancer of the uterus also passed a few years ago. The removal of cancer of the rectum must proceed on the lines laid down by Wertheim as necessary in hysterectomy for cancer of the uterus. In other words, important structures like the ureters must be recognized and, if necessary, isolated, while the whole of the diseased structures within the pelvis and at its outlet, together with a wide margin of apparently healthy muscular connective tissues and bowel, both laterally and above and below the recognizable disease, must be swept away. To accomplish this satisfactorily in most cases meant a permanent colostomy, if the immediate dangers and the ultimate disabilities in the shape of cicatricial contraction and loss of control with a perineal anus were to be overcome.

Mr. Miles, in reply, said he could not agree with Mr. Lockhart Mummery that it was possible to perform an adequate operation if the tissues forming the pelvic floor were left *in situ*. It was true that patients did not like the idea of having a colostomy, but at the same time they should not be allowed to choose an operation which was bound, it seemed to him, to be followed by recurrence.

A CASE OF SECONDARY SUTURE OF THE CIRCUMFLEX NERVE.

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THE patient was a labourer, aged 35, who was sent for operation from the electrical department. The history of the case is as follows:

On January 1st, 1908, while asleep, he was kicked on the back of his right shoulder. Next day his back and arm were discoloured, and he was unable to abduct the right arm, and the shoulder was painful. A fortnight later he came to the Western Infirmary and was seen by Dr. Taylor. He could then use the hand and elbow, but could not abduct the arm. Dr. Taylor referred him to Dr. Hay, and electrical treatment was begun. On August 25th—that is, nearly eight months after the accident—Dr. Hay referred him to me with a view to operation.

State on Examination.—He was unable to abduct the arm to an extent greater than about 30 degrees, and there was marked atrophy of the deltoid, the roundness of the shoulder having disappeared, and the sharp outline of the acromion being prominent. On testing the deltoid electrically no responses whatever could be elicited either with the interrupted or with the continuous current. This was not, however, the only defect. Dr. Hay, in referring the case to me, called my attention to a displacement of the scapula which was present, and on examination I was able to confirm the presence of a marked displacement of the lower angle of the scapula, which was very prominent. Also when the patient's hand was placed upon his opposite shoulder the deformity became very much more pronounced, the vertebral border also then being quite prominent. The level also of the scapula was changed. Thus the inferior angle of the right scapula was 2 in. higher than the corresponding part on the left side, and the former was closer to the middle line, the exact distance being 2 in. as compared with 2¾ in., the corresponding measurement on the left side. It was evident, therefore, that the inferior angle of the scapula had been displaced upwards and inwards in addition to backwards. No muscular atrophy other than that evident in the deltoid could be determined. One other indication was present, and that was hyperaesthesia over part of the area supplied by the circumflex nerve—namely, the area over the outer and upper aspect of the region supplied by the cutaneous branch of the circumflex. There was also an area here which showed dullness, and this condition was previously noted by Dr. Hay.

Treatment.—On account of the lapse of time (eight months) from the date of accident without sign of spontaneous muscular restoration, but, on the other hand, with marked evidence of advanced atrophy in the deltoid, it was decided to expose the circumflex nerve in the axilla. The development of hyperaesthesia over part of the cutaneous distribution was not regarded as a sign of efficient restoration of the nerve, and, with evidence of progressive wasting of the deltoid, the probability of a spontaneous restoration of function was very remote. The operation took place on August 26th, 1908. An incision, 6 in. long, was made from the posterior margin of the axilla downwards and forwards to the middle axillary line. The long thoracic nerve was exposed and found to have a normal aspect. The serratus magnus was then examined, and appeared to be healthy and well developed. Stimuli were then applied to the nerve, and prompt and vigorous contractions of the serratus were the result. The serratus magnus had therefore nothing to do with the malposition of the scapula. Next, the circumflex nerve was sought, and this was easily found, as it passed through the quadrilateral space to wind round the humerus. The nerve was found swollen, as is commonly the case with damaged nerves, and about an inch proximal to the point where it leaves the axilla the damage was found. Two bulbous ends—a larger central and smaller peripheral—were united by a thin band of cicatricial tissue. Stimuli applied at different levels of this nerve above and below the damage failed to produce any response in the two muscles. The two bulbs with the intervening cicatricial tissue were excised and the two nerve ends united by catgut.

Result.—The wound healed by first intention, but after the first month I had not an opportunity of seeing the patient for about six months, and at that time restoration of function was found to be considerably advanced. He stated that no improvement occurred for several months, and that by five months from the date of operation he could raise the arm above his head. When examined on February 24th, 1910—that is, eighteen months after the operation, the following is the report of his condition: He was able to abduct the arm normally, and to raise it above his head almost quite as well as he could his left arm. The volume of the deltoid was not quite as great as that of the right muscle, but it was well filled up, rounded and firm, and was felt contracting well when the hand was placed upon it while he was abducting the arm. The malposition of the scapula had almost entirely disappeared. A slight prominence of the inferior angle was seen, but it was trivial. When he placed the hand on the opposite shoulder there was no outstanding of the vertebral border, such as formerly suggested "winged scapula." The level of the scapula also corresponded with that of the left side. As regards the cutaneous distribution, the area which before operation was hyperaesthetic began a few months after the operation to develop a disagreeable sensation, which he describes as a gnawing sensation. This had now very considerably disappeared, but an area now measuring 3½ in. by 3 in. on the outer and upper aspect of the arm was still not quite normal. Light touch was felt everywhere, but not quite so clearly as over the corresponding area in the other arm. Deep pressure caused a slightly painful sensation. The prick of a needle in any part of the area was at once appreciated as pain, but it was not so keen as on the opposite corresponding area, and on other parts of the arm outside of the affected area. The sense of thermic difference was quick and correct. There was still a slight sense of gnawing in the part, but it was very much less than formerly, and was gradually becoming less.

Final Result.—When seen again last June, that is, twenty-two months after operation, further improvement had taken place in the four months which had elapsed since he was last seen, and now the muscle was well developed and powerful, and enabled him to raise his arm practically to the normal extent.

OBSERVATIONS.

The portions of nerve removed at the operation were found joined together by a portion of tissue presenting the appearance of connective tissue. These portions were all removed in one piece, and this was fixed with Müller's fluid and cut into a complete series of longitudinal sections by imbedding in paraffin with the object of ascertaining the amount of nerve union. One of the sections chosen from the middle of the series, where the approximation attained by the central to the peripheral end is closest, shows a portion of the central swelling terminating in a knob-like end, and also a peripheral swelling or bulb of smaller dimensions. These two ends are sharply demarcated from the connective tissue which holds them together. That connective tissue presents the usual appearance of cicatricial tissue, but about its centre can be seen evidences of bridging between the two ends by a few nerve fibres (Fig. 5).

The number of these nerve fibres is not sufficient to constitute a proper union of the nerve, but may account for the development of the type of sensation which appeared in the area supplied by the cutaneous branch of the nerve—namely, hyperaesthesia. They did not prevent the deltoid from continuing to atrophy to an extent that even its galvanic irritability could not be elicited.

The microscopic appearances here are of much interest as showing the very close proximity in which nerve ends may lie without being able to make a union by nerve substance sufficient to enable normal conductivity to be restored, and in this case the cicatricial tissue intervening does not appear to have been of a very dense type likely to have interfered with the process of regeneration merely by its compressing force. Also the time which elapsed before the specimen was removed at the operation, namely, eight months, renders it improbable that an efficient union would have taken place had further time been allowed to elapse.

The explanation which appears to me to be the correct one is that the cause which prevents the union of the divided ends is that which was produced at the time of the accident, namely, bruising and laceration of the tissues in the immediate neighbourhood. The result of this is that at the commencement the process of nerve union is interfered with and prevented from taking place, and the two nerve ends instead of being united by nerve fibres become enclosed in a covering of cicatricial tissue which hinders subsequent efficient union. Inadequate paths may bridge across the gap, as in this case, but if anything prevents the efficient union being laid down at once it will stand a poor chance of forming later on.

Where a nerve is divided without much bruising to the surroundings, as in an aseptic operation, it is well known that union is the rule, even although the ends are not left quite in apposition and frequently even although they should be left considerably separated; but it is quite otherwise where the nerve ends are left even in close apposition in the midst of bruised or otherwise seriously damaged tissues, even although these injured tissues are not in communication with a wound and are free from the action of organisms.

With reference to the complete recovery which has taken place in this case in consequence of the surgical intervention I should like to contrast with that the result which might possibly be attained without such intervention. Frequently these cases remain with permanent loss of function, usually with impaired function. In this

case at eight months there was practically no improvement in the movements, but it is well to remember that it is possible for very considerable restoration of function to take place although the deltoid remains permanently atrophied and consequently useless. This restoration of function is wholly vicarious, and is produced by hypertrophy and overaction of the muscles which rotate the scapula, and which normally are called upon to rotate the scapula in order to enable the arm to be elevated, normally acting in association with the deltoid. With a completely destroyed deltoid these muscles by overaction may take up much of the function of the deltoid, aided perhaps by hypertrophy and additional action of the supraspinatus. Some years ago I published in the JOURNAL[3] a case of this kind, with photograph of the patient elevating his arm, and reference to that paper will show the astonishing degree to which this vicarious function can develop. Thomayer[2] and Bäumler[1] had previously published observations of the same kind, but in their cases the vicarious restoration had not proceeded to any great extent. I have not met with another case resembling that which I published, and possibly it is altogether exceptional.

It may be noted also that the patient who exhibited that recovery was most persevering with his efforts to develop his muscles, and it is probably only under such circumstances that appreciable vicarious function would develop. Even with these efforts the vicarious restoration became efficient only after about eleven months of hard exercises, and at the end of a further period of six months did not enable him to do a hard day's work without exceptional exhaustion. Even in that very marked case of vicarious restoration the extent to which the arm could be elevated fell considerably short of the normal, whereas in the case which I now publish the suture of the nerve has restored the movements quite to the normal.

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ON CERTAIN FACTORS THAT INFLUENCE THE IMMEDIATE RESULTS OF SURGICAL OPERATIONS.

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ASEPSIS and anaesthesia are the foundations upon which surgeons of this generation have based the development of a practice so efficient that the mortality rate of the leading operators in all parts of the world in uncomplicated major operations is approaching the vanishing point. This rise in efficiency has evolved from increments contributed by many men, and through a generous dissemination of knowledge. An almost startling proportion of the progress has consisted in ridding our technique of traditional mistakes. But there still lies before us the difficult problem of bringing relief to patients who require operation in the presence of some serious handicap. In these cases we must not only omit the errors of the past and practise the virtues of the present, but we must find new and fundamental methods. In the few remarks I have the honour to make, I hope to offer some suggestions as to the directions of investigation that have seemed to me to hold promise. I shall therefore limit myself to a group of operations from which our present mortality tables are largely gathered. I shall consider those patients who are impaired (1) by infection, (2) by anaemia, (3) by shock, and (4) by psychic influences, and I shall discuss these topics especially with reference to their effect upon the brain cells, and from the restricted view-point of the immediate operative results.

So familiar are the functions of the cells of the brain that we scarcely realize that those functions are the most consequential facts in Nature. Is it not inspiring to contemplate that the brain cells have probably descended in an unbroken succession of generations since before the Cambrian period—many million years—and that during this vast period of descent these cells have transmitted with infinite precision the changes wrought upon them by environment, and that their marvellous manifestations of activity which we behold about us to-day are but an accumulation of variations in Nature, aided by natural selection and inheritance, thus binding them—that is, ourselves—to the entire past? These brain cells are the dominant cells of organic life, and have existed amid the vicissitudes of change with less alteration than even the crust of the earth. Whether they be lodged in man or in the lower animals, they are related to and obey the same general biological laws, and their discharge of energy is governed by the laws of inheritance and of association.

Nature has shown her appreciation of the cells of the nervous system by her extraordinary care in providing an efficient protection against traumatism, and by a remarkable provision for a constant blood supply. The mechanism of these nerve cells is exquisitely balanced, and their metabolic processes are the highest in the organic scale. It should surprise no one to find these cells sensitive to toxins, to anaemia, to trauma, to certain drugs, and to certain psychic influences.

While engaged with me in a research on anaemia and shock, Dolley found that the morphologic law of alteration in nucleus plasma relation in protozoa subjected to fatigue, to hunger, or to cold, enunciated by Hertwig, applied to the cells of the brain. Utilizing this observation, Drs. Austin and Sloan investigated with me the changes in infections, certain drug poisons, trauma, and fear.

In the early stages of acute anaemia, of shock, of fear, and of strychnine poisoning, there is an increase in the size of the cell and in the amount of Nissl substance. This probably indicates an increased functional activity of the cell. In toxaemia this stage is not seen. In the later stages of cell changes, whatever the cause, the morphologic alterations are similar. A summary of the morphologic alterations seen in shock will therefore suffice for those seen in anaemia, in toxins, and in fear. Quoting from a previous paper:

In uncomplicated surgical shock in animals of various grades of severity produced by trauma under ether anaesthesia, in which the anaemic factor was wholly excluded by transfusion, there were corresponding changes in the structure of the nerve cells in all parts of the brain, and an alteration in their reaction to the Nissl stain as well. The structural changes of the cells include alteration in the absolute size of the cells; in the size relation of the nucleus and cytoplasm; in the membrane surrounding the cell and the membrane surrounding the nucleus; and, finally, in the general contour of the cell. As to the gross size, the increase varies from slight to even eight times the normal. In the normal there is a certain relation between the size of the nucleus and the remainder of the cell. In shock the nucleus becomes relatively larger. In the normal the membrane surrounding the cell and that surrounding the nucleus always presents an unbroken continuity; in severe shock these limiting membranes may be extensively ruptured, affording no restraint to the forces that produce distortion of the cell structure. In extreme cases the cell completely loses its contour and presents the appearance of a disorganized mass of protoplasm. As to the changes in their reaction to the Nissl stain, there is at first an increase in the amount of the Nissl staining substance; later, as the degree of shock is increased, the reaction to the stain diminishes; and in the final stages there is little or no staining reaction. Even in cases of fatal shock only a certain proportion of the cells are thus altered.

On morphologic grounds, when the nucleus, the nucleolus, and the cell body become so altered as to leave an undifferentiated mass of protoplasm, the cell is certainly dead and will never regenerate. This probably constitutes a part of the so-called wear and tear of life. The gravity of a given case of shock is indicated by the percentage of cells that are thus broken down and killed. The damage of pure trauma without anaemia is manifested in the cells of the cortex, of the cerebellum, and of the medulla as widespread as the symptomatology. The spinal cord is little, if at all, affected. Nerve cells that have been impaired by overwork, anaemia, infection, drug poisons, shock or fear, obey the same general law of morphologic change. Therefore the changes that are seen in the brain cells are not in the least specific for any one factor—at least, not in the diseases and injuries and by the methods we have thus far studied them.

Anaemia.

Anaemia of the brain was studied in animals killed by chloroform or suffocation, then resuscitated by centripetal arterial infusion of adrenalin and rhythmic pressure upon the thorax.

In acute anaemia of the brain changes, varying from temporary hyperchromatism through every stage down to the death of the cell, are seen. The appearance of an increase in the Nissl substance immediately following anaemia is probably due to a final effort at compensation. The potential energy of the cell is soon expended. If this effort does not result in an efficient circulation through the brain, collapse and death must follow.

This is a fact of great clinical importance. The practical lesson is that we should not permit our patients to continue in the state of anaemia long enough to reach this fatal cycle. There is another point with reference to anaemia of the brain which has both a philosophic and a practical point of view. In our work on resuscitation we found, in agreement with Hill and with Stewart, that the various parts of the brain were not equally affected by a given degree of anaemia. The vasomotor and the respiratory centres are less affected than the cerebral cortex. We have been able so to time the resuscitations that the cortex was destroyed and the medulla lived. In a general way it would seem that the resistance to anaemia is governed by phylogeny—the older the function the more resistant it is to anaemia. Experimental decerebrates may in this manner be created at will. In two cases of resuscitation in the human, Dr. Sloan and I confirmed many of the foregoing phenomena. From the time of resuscitation until death, six and twenty-four hours respectively, no part of the brain phylogenetically younger than the vasomotor and the respiratory centres functionated. The individuals as such were dead, while the circulation and the respiration, whose failure was awaited to complete death, were fairly good.

A brain damaged by anaemia impairs the surgical risk.

Infections.

We examined the cortex, cerebellum, and medulla in the following *classes* of infections:

(*a*) Staphylococcus and streptococcus peritonitis.
(*b*) Toxaemia from gangrene of the intestine and from the expressed juice of gangrenous infected tissue.
(*c*) Acute streptococcaemia in a young human adult.

The experiments on intestinal gangrene may be worth special mention. On removing the clamp that caused the obstruction that produced gangrene the animals soon died. If the obstruction was unreleased, the animals died, but later. Even when a previous entero-enterostomy had been made and the isolated coil was used for the experiment, death still occurred. As a rule there was no peritonitis, and death took place in from twelve to twenty-four hours. If a complete resection of the gangrenous segment was made, death nevertheless occurred in about the same time, but by making an external drain in the experimental loop the animals lived. These results were at once explained by injecting a very small quantity of the juice expressed from the tissue of the gangrenous coil subcutaneously, intravenously, or intraperitoneally, into a sound animal. Even when the juice was injected by a hypodermic needle into the lumen of the normal bowel, serious illness followed. The symptoms were precisely the same as those so frequently observed following resection for gangrene of the bowel in man. The coincident widespread impairment or destruction of the animal's brain cells told the entire story. Undoubtedly, at the time of the operation of resection a sufficient amount of the toxins had already been absorbed and fixed in the brain cells to cause death; or, if there had not been toxins enough, death was made more certain through the amount of poison squeezed into the circulation by our wholly unguarded manipulation of the gangrenous gut. Had we realized the deadly poisonous nature of the fluid we thus heedlessly pressed into the circulation, we would have altered our technique by clamping off the circulation through adjacent healthy tissue before dividing the strangulating ring. I have practised this method since I have understood that the fatalities in these cases are due principally to a toxic destruction of the brain cells. In the streptococcaemia patient I could well understand the delirium and the unconsciousness when I beheld the destruction of his brain cells. This is probably the key to the rôle the infections play in the immediate surgical risk and in the convalescence. Is it not possible that, in some instances at least, the gross lesion at the seats of the peripheral focus of infection is of less importance than the microscopic lesion in the brain cells?

Fear.

Contemplating the paralysing influence of fear on both man and the lower animals, and the great rôle played by fear in surgery, we investigated the question as to whether or not uncomplicated fear caused morphologic changes in the brain cells of rabbits. Killed in the midst of fright the brain cells showed an increase in the Nissl bodies and in the size of the cells; killed several hours after the fright there were seen the changes described in the later stages of experimental shock. This statement is based on a study of the microchemical stain, the measurement of the cell body and the nucleus compared with a corresponding series of normals run through by a parallel technique. Uncomplicated fear in rabbits causes widespread morphologic changes in the brain cells. The maximum change was seen in the cortex and in the cerebellum, less change in the medulla, and none in the cord.

We may summarize the preceding as follows: Trauma, anaemia, infection and fear, cause definite, easily demonstrable changes in the brain cells. These changes vary from alterations in the quantity of Nissl's substance, the size of the cell, the relation between the nucleus and the cytoplasm, and finally destruction of the cell.

In a case of infection the cells might be as effectively further damaged by haemorrhage, by trauma, or by fear, as by more infection; in a case of anaemia the brain cells might be as effectively further damaged by infection, by trauma, or by fear, as by more haemorrhage; in a case of shock the brain cells might be as effectively more damaged by toxaemia, by haemorrhage or by fear, as by more trauma; in a case of Graves's disease, the brain cells may be further damaged by infection, by haemorrhage, by shock, and by fear, as well as by the administration of thyroid extract or by psychic stimuli. Trauma, anaemia, infection, and fear, singly or in combination, damage the brain cells, and so influence the immediate surgical risk. Patients handicapped by shock, anaemia, or infection, have therefore a decreased margin of safety. These factors stand as a fixed charge; the surgeon must, therefore, reduce the expenditure of vitality incident to the operation. In some cases the reduced margin may be partially restored by a certain procedure to be later mentioned. In this group of handicapped cases, if operations are to be more safely performed, new methods must be employed. The new methods relate to the anaesthesia and the operative technique.

First discussing inhalation anaesthesia, I have been struck with the contrast between the degree of shock in operations under nitrous-oxide-oxygen anaesthesia and ether anaesthesia. Based on observations on 1,220 major operations under nitrous-oxide-oxygen anaesthesia, and a laboratory research consisting of administering as nearly as possible an equal amount of trauma in two series of animals, one series under nitrous oxide anaesthesia, the other under ether anaesthesia, making blood-pressure tracings during the application of the shock producing trauma, and making neurocytologic studies of the brains, the following statements seem warranted:

The blood pressure in the nitrous oxide series showed far less change than in the ether series. In a large number of cells, counted and studied in shock experiments, the number of cells destroyed in the ether series was not less than four times as great as in the nitrous oxide series.

In the clinic the difference is certainly no less striking. We must conclude that either nitrous oxide acts as a protective against shock, or ether predisposes to shock.

As to anaesthetics in the infection, contrasting the immediate and the post-operative results in 75 consecutive cases of acute perforative appendicitis operated on under ether anaesthesia, and 75 under nitrous oxide anaesthesia, the average pulse-rate in the ether series at the time of operation was 114, and during the twenty-four hours after the operation the average increased to 122. The average pulse-rate in the nitrous oxide cases at the time of operations was 115, and during the first twenty-four hours after the operation the average fell to 105. There was in these cases an average difference during the first twenty-four hours of 18 beats in favour of the nitrous oxide cases. In other respects the nitrous oxide patients were equally better off. Nausea and vomiting following nitrous oxide is inconsequential as compared with ether. Graham of Chicago has shown by experiment that ether causes a

distinct impairment in immunity. In not a single instance following nitrous oxide anaesthesia did the patient follow the acutely accelerated course to death, as I have occasionally observed following ether. I am quite certain that in a close case etherization *per se* would sufficiently impair the patient to cause death.

Among the factors under consideration—shock, fear, and anaemia are to the greatest degree controllable; indeed, as I shall hope to show, in many instances are under complete control. We will first consider shock and fear.

Turning to surgical shock, if we would prevent it we must first understand the cause. Between our inner selves and the environment in which we are immersed there intervenes the skin, in which are placed numerous nerve endings which act as specific receptors for conveying pertinent information to the brain. In the deeper parts other receptors are found. The receptors whose specific duty is that of warning against harmful influences are called nociceptors (Sherrington). These are found only in the part of the body which, in the course of evolution, has been subjected to injury frequently enough to be of selection value. Thus, the abdomen, the feet, the hands, and so on, have numerous nociceptors, and are, therefore, shock-producing territories on the receipt of adequate stimuli. Because the brain has been protected through the vast ages, it has no nociceptors, and trauma is, as my experiments seem to show, incapable of producing true surgical shock. It follows, therefore, that the various regions of the body have shock values somewhat in proportion to the number of nociceptors.

The causes of shock are fear and adequate trauma of tissue that contains nociceptors. Trauma and fear are phylogenetically of near kin, having arisen from the same general cause and act in a similar manner. Both cause a pathologic discharge of nerve energy, which may be followed by exhaustion, just as the erotic feeling is produced by adequate psychic or mechanic stimuli. Now the factor of fear may be almost wholly excluded by management of the patient, and in part by the administration of morphine or scopolamine, or both. The other shock-producing factor—trauma—may be excluded by interrupting the physiologic connexion between the brain and the field of operation by the use of local anaesthesia, whether by infiltration, intraneural, or by the spinal method. By excluding both the psychic and the traumatic factors, shock itself is excluded. The factor of anaemia may be completely controlled by the direct transfusion of blood, provided, of course, it is done before there is destruction of the brain cells.

The foregoing principles may be illustrated by indicating their application to several types of cases.

In cases of senile and diabetic gangrene we have types of handicapped patients. The practice in these cases should be gas and oxygen anaesthesia; in younger subjects morphine and scopolamine, to protect the cortex against fear—in the aged senility alone is sufficient protection against fear—infiltration anaesthesia of the skin; intraneural anaesthesia of nerve trunks, no tourniquet, sharp division of the soft parts to the bone, division of the bone with a Gigli saw, gentle retraction of flaps, tying of vascular trunks in continuity, securing all vessels en route, maintaining a dry clear field. As far as possible all handling should be on the distal side of the field—in short, a feather edge technique. Since following this plan I have made twelve amputations, for gangrene of the leg, without a fatality. Indeed there is usually no noticeable operative effect.

Graves's Disease.—A study of 120 operations for Graves's disease convinced me that in Graves's disease there is a hypersensibility to trauma and to fear—the two primary factors in surgical shock. Hence operation upon any other part of the body having nociceptors would cause the specific reaction seen in Graves's cases—a reaction sometimes called hyperthyroidism—as readily as operations upon the neck. Therefore, by excluding completely by a special method the psychic factor and anaesthetizing the field of operation with cocaine as carefully as though no inhalation anaesthesia were being given—that is, by controlling both the cortex and the periphery, one by inhalation anaesthesia and special management, the other by local anaesthesia—the central nervous system is completely isolated—marooned—and no reaction follows. This technique has wholly altered the immediate operative results.

Pathologic intracranial tension threatening total anaemia of the brain constitutes an especially grave handicap. Recent researches have shown that the brain cortex cannot endure total anaemia more than six and a half to eight minutes. The high blood pressure in these cases is, it seems, due to an effort on the part of Nature to protect the brain against anaemia. By the general surgeon increased intracranial pressure is encountered most frequently in intracranial haemorrhage and in depressed fractures. In these cases a high pressure should be maintained until the pathologic intracranial tension is relieved. If the patient is comatose, or nearly so, no general anaesthesia should be used. With cocaine as an anaesthetic, one may turn down an osteoplastic flap, or at least may open the skull. Should a general anaesthesia be needed, a momentary nitrous-oxide-oxygen anaesthesia which does not lower the blood pressure may be used with advantage.

Many of these head cases, formerly operated upon by routine methods, without due appreciation of the imminence of and the disasters following total anaemia of the brain for even a few minutes, were, as I believe, dispatched by the unintelligent technique that was intended to give relief.

In the acute surgical infections, especially of the abdomen, one should guard against any further lowering of the immunity of the patient, and further injury of the brain cells. This is, perhaps, best accomplished by giving nitrous oxide instead of ether because of the specific damage of ether to immunity and because of our clinical evidence that nitrous oxide produces no such damage, and by a minimum trauma as so strongly urged by Murphy.

Fear, as an active agency in further damaging the already impaired nerve cells, should, as I interpret the evidence, be especially avoided. In addition to specially orienteering morphine and scopolamine are therefore useful.

Patients handicapped by a seriously depressed vitality from long-continued infection or by starvation or loss of blood may be reclaimed in a remarkable manner by the direct transfusion of blood. By this technique such hazards as resection of the stomach in emaciated, starved subjects, in haemorrhage from gastric ulcer, gastro-enterostomy in a starving infant with congenital pyloric stenosis, and a number of otherwise hopelessly handicapped patients were successfully carried through the indicated operation. Then, too, in certain cases of pathologic haemorrhage, and in post-operative haemorrhage, transfusion is occasionally a life-saving resource.

Post-Operative Neurasthenia.

We have been so engrossed in our technique and in the lesions of the various organs and parts of the body that we have almost forgotten the all-important normal brain. I have been astonished to find to what extent the public have come to expect nervous disarrangement for from six months to a year after operations—about as long as is required to recover from a nervous breakdown or from the acute phenomena of a major grief. In more than 1,000 cases I observed as to this point I found that harmful mental impressions could be greatly minimized by giving morphine and scopolamine prior to operation, by making the least possible show of preparation, and by the administration of the innocuous nitrous-oxide-oxygen anaesthesia, and in particular cases the addition of local to general anaesthesia—that is, a peripheral as well as central dissociation. To needlessly expose a sensitive, highly organized brain to the naked perception of the possibility of death from an operation is like uncovering a photographic plate in the bright sunlight to inspect it before putting it into the camera. Inasmuch as it is now established that brain cells may be morphologically altered by psychic and by traumatic stimuli, and that the psychic stimuli may be excluded by morphine and special orienteering, and the traumatic stimuli by cocaine blocking, it follows that the brain may in many operations be wholly isolated from all impulses, so that no post-operative nervous impairment follows.

Conclusion.

The dramatic period of surgery based on gross anatomy culminated in the days of the Coopers and the Potts. The enunciation of the principles of asepsis by Lister, and the discovery of anaesthesia by Morton and Simpson, opened a new era in which the human body was dissected to its last microscopic analysis. Operations of magnitude not dreamed of by the old masters are now performed in the farthest outposts of the civilized world, with a mortality in good risk patients that is approaching the vanishing point. It would seem that this era of the great triumvirate of

anæsthesia, asepsis, and pathologic anatomy is nearing its zenith. Is not the next great impulse which is even now being given, and principally by Englishmen—among whom no one has contributed more than your distinguished Chairman—is not this impulse in the direction of our final goal? Are we not on the threshold of the era of physiology, the interpretation of the laws of life itself?

So long have we directed our attention upon tumours, infection, and injuries, that we have not sufficiently studied the vital force itself, and we have viewed every anatomical and pathologic part as an entity, and man as an isolated phenomenon in nature. May we not find in the laws of phylogeny and association the master key that will open to us the explanation of many of the pathologic phenomena as they have already explained many normal phenomena? And may medicine not correlate the pathologic phenomena of the sick man with the forces of evolution, as the naturalists have correlated the phenomena of the sound man, and disease as well as health be given its evolutionary setting?

THE OPERATIVE TREATMENT OF CHRONIC MUCOUS AND ULCERATIVE COLITIS.

By P. LOCKHART MUMMERY, B.C., F.R.C.S.,

Jacksonian Prizeman and late Hunterian Professor, Royal College of Surgeons; Senior Assistant Surgeon, St. Mark's Hospital for Cancer, Fistula and other Diseases of the Rectum; and Senior Surgeon to Out-patients, The Queen's Hospital for Children, Hackney.

IN considering the surgical treatment of these conditions we must bear in mind that mucous colitis on the one hand is a condition that is not even remotely fatal, while ulcerative colitis on the other hand is a very fatal disease, more serious than acute appendicitis, and with an untreated mortality of over 60 per cent.

Chronic mucous colitis is a condition which only calls for operative treatment in severe cases when medical treatment has failed to give relief. The majority of cases will yield with time and patience to suitable non-operative treatment, and it is only in very severe cases that operation is indicated, and only then when the patient is seriously incapacited by the condition. In any case, operations which involve serious risk to life are not permissible.

Before considering the question of operative treatment in cases of chronic mucous or membranous colitis it is necessary to verify the diagnosis by sigmoidoscopy. If this is not done good results cannot be expected from operative treatment. My experience has been that more than half the cases of so-called chronic mucous colitis are not suffering from colitis (that is, inflammation of the colon) at all, but from some other condition of the colon which is causing excessive mucous secretion. It may be accepted as an axiom that any lesion which causes either a local or general irritation of the colon may give rise to the passage of mucus in the stools either in the form of shreds or membrane. Before attempting, therefore, to treat any case of mucous or membranous colitis it is essential to verify the diagnosis or failure is more than likely to be the result.

Leaving out of account those so-called cases of mucous colitis in which the symptoms are secondary to some lesion of the bowel other than inflammation of its walls, and in which no colitis can be demonstrated by sigmoidoscopy, there are two methods of treating mucous colitis by operation:

1. Giving rest to the colon by colotomy, or ileo-sigmoidostomy.
2. By establishing an opening in the cæcum, through which the colon can be washed out.

Both these methods have given satisfactory results as regards curing the condition, but we have to take into consideration that mucous colitis is not a fatal disease, and that it is, therefore, hardly justifiable to perform an operation such as ileo-sigmoidostomy, which is inevitably accompanied by a serious risk; or, on the other hand, to perform a right-sided colotomy, which will seriously and often permanently invalid the patient. Indeed, most patients will prefer to put up with the colitis rather than suffer the inconveniences of a colotomy opening on the right side; and a left inguinal colotomy, though the operation has sometimes been performed for this condition, is obviously useless, as it does not get above the disease. Moreover, in the case of a right-sided colotomy, it is impossible to promise the patient that the colotomy can subsequently be closed without risk of the colitis recurring.

The second method—namely, by the performance of appendicostomy—has none of these disadvantages. The operation is practically free from risk, and the artificial opening for irrigation purposes thus established does not cause the patient any inconvenience whatever, and he is in no way incapacitated by its presence.

The results of appendicostomy in cases of chronic mucous colitis are good. The patients rapidly improve in general health, they put on weight, often with surprising rapidity, and the neurotic symptoms, which so frequently accompany the condition, disappear. I have several times seen patients who had previously been chronic invalids become quite ordinary active people as a result of keeping the bowel washed out for a few months.

Cases.		Results.		Remarks.
Author	6	Cured	4	All well over a year later; there were slight temporary relapses in tw cases.
		Improved	1	
		No better	1	
Edwards	1	Cured		
Tuttle	2	Cured	1	
		Improved	1	
Willis	1	Cured		
Keetley	3	Cured	2	
		No better	1	
Moynihan	1	Cured		
Armour	1	Cured		
Stretton	3	Cured	1	
		Improved	1	
		No better	1	
Grey	1	Recovered		Slight relapse two years later.
Pringle	1	No better		
Total	20			

Cured, 13; improved, 3; no better, 4. Slight relapses in 3 cases.

Slight recurrences of the colitis occasionally take place, but are quickly recovered from by resuming the irrigation of the bowel, and in a majority of the cases a complete cure results.

Cases have been recorded in which no improvement followed appendicostomy, but there is strong presumptive evidence that these were not cases of true colitis; thus in three such cases which have come within my own knowledge there was no positive evidence of colitis, and in one of them the patient was subsequently discovered to be suffering from cancer of the sigmoid flexure. The following is a good instance of the importance of a careful sigmoidoscopic examination before proceeding to treat a case for chronic mucous colitis:

J. B., a man aged 41, had for some months been treated for chronic mucous colitis, without any improvement. His symptoms began about eighteen months before I saw him. There was intermittent colicky abdominal pain and discomfort, accompanied by the passage of much thick mucus in his stools. The bowels were very constipated with an occasional attack of diarrhœa, when little but mucus was passed. There had never been any blood in the stools. He looked in good health, and had not lost weight. His appetite was good, and he had been attending to his business up to the time I saw him.

An examination with the sigmoidoscope showed no colitis, but I was able to see a cancerous growth about the size of a two-shilling piece at about the centre of the pelvic colon. This was subsequently resected and the patient recovered.

I had a similar case last year, in which a woman, aged 42, supposed to be suffering from chronic colitis, was found on examination to have a small cancerous polypus in the colon. This was successfully resected.

Ulcerative Colitis.—This condition, unlike chronic mucous colitis, is very serious and often fatal. In the cases which I collected two years ago for the Jacksonian essay, the mortality in unoperated cases was 78 per cent., while in the discussion on ulcerative colitis, which took place at the Royal Society of Medicine in January, 1909, the figures from different London hospitals showed a mortality in all cases of over 50 per cent. I feel certain that this mortality can be almost entirely done away with

by early appendicostomy in all cases of ulcerative colitis. Appendicostomy enables the condition to be controlled almost immediately, and if performed early will save the patient's life.

The operation is not a serious one, and can be performed very quickly in most cases. It has the further advantage, as compared for instance with caecostomy, that it does not result in an unpleasant faecal opening or in any incapacity whatever. When not being used, the opening causes no inconvenience, and does not necessitate the wearing of any apparatus.

Ulcerative colitis is a condition which can be easily diagnosed; the only condition with which it is likely to be confused is enteric fever, and from this it is easily distinguishable by Widal's reaction or sigmoidoscopy.

I have only met with one case in which the operation failed to save the patient's life, and that was a case of very severe acute pneumonic colitis, in which the operation was not performed till over a fortnight after the onset of the condition. Even then the colitis cleared up, but the patient died from complications.

I wish to urge the importance of immediate appendicostomy in all cases of ulcerative colitis, and I feel convinced that if this treatment is adopted we shall do away almost entirely with the present very high mortality of this disease.

I daresay it will be said that many cases of ulcerative colitis do recover without operation. This is undeniable, but recovery in these cases is in my experience a long and tedious process with frequent relapses, and it is often a year or more before the patient is well again; whereas, if appendicostomy is performed, the patient is usually well again in a few weeks.

When we consider that the operation, especially if performed early, is practically free from any risk, and that it does not involve any disagreeable condition or disability, there can be no reasonable objection to its being performed in all cases once the diagnosis has been established. Indeed, I have more than once performed the operation upon patients who had recovered from an attack of ulcerative colitis to stop repeated recurrences.

It is quite remarkable how quickly an improvement occurs in cases of ulcerative colitis after systematic lavage of the colon through an appendicostomy opening is commenced. The almost constant diarrhoea and foul liquid stools containing blood are quickly checked, and the patient, instead of looking like a dying person, becomes himself again. The profound toxaemia, which is such a marked feature in bad cases of ulcerative colitis, can only be adequately dealt with when the colon can be washed completely out, and this is impossible unless appendicostomy is performed. When the colon is extensively ulcerated absorption into the blood stream of any poisonous substances contained within its lumen readily occurs, and this absorption takes place over such a large area that the patient is rapidly and seriously poisoned by the contents of his colon.

It is this which explains the failure of purely medical treatment to deal with the disease, for nothing short of the constant removal of the toxic products produced in the colon can be expected to prevent this absorption. It is quite impossible adequately to wash out the colon by means of rectal injections, quite apart from the fact that the bowel in these cases is so irritable that they are immediately rejected.

I believe that the correct treatment for all cases of ulcerative colitis—apart from amoebic dysentery, of which in its acute form I have no experience—is immediate appendicostomy, and that if the operation is performed early the present high mortality will disappear.

CONDITIONS LIABLE TO BE MISTAKEN FOR CANCER OF THE STOMACH.

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The practice, which has long prevailed in the Edinburgh school, of making complete sections of diseased organs, or parts of organs, thin enough for microscopical examination, is of great value in determining not only the nature of the disease, but its distribution and also any secondary changes which may have occurred. With the aid of my senior assistant, Mr. J. M. Graham, and Mr. Richard Muir, of the Pathological Department of the University, I have completed the examination of the portions of stomach I have resected for cancer; 24 of these were available, and in no less than 6 it was found that the lesion was a fibromatosis associated with chronic ulcer. It seemed desirable to examine the portions of stomach resected for cancer by my colleagues on the infirmary staff, and I must confess it was consoling that of 25 specimens kindly placed at my disposal, no less than 7 were found to be free from cancer.

With my eyes thus opened, I thought it would be interesting to have an inspection of the gastric cancers in the anatomical museum of the university. I had no difficulty in picking out a considerable number in which the appearances threw doubt on the accuracy of the view expressed in the catalogue. Through the kindness of the conservator, Professor Arthur Robinson, I was able to cut sections of the doubtful specimens, and although the material was not well preserved for microscopical examination, there were 6 out of 21 that showed no trace of cancer. If the three groups of specimens are added together, we have a total of 72, and of these 26.38 per cent. were lesions which simulate cancer. I was already familiar with the simulation of carcinoma by non-malignant affections in the colon and in the rectum, but I had no idea that the recognition of cancer in the stomach was so uncertain as these figures would indicate.

In the stomach, the lesion which most closely simulates cancer, and is most often mistaken for it, is a diffuse form of fibromatosis associated with ulcer; there are also rarer forms of fibromatosis—for example, those associated with tuberculosis and with syphilis.

Fibromatosis of the Stomach.—I venture to suggest this term in place of those previously employed, of which the best known are cirrhosis, linitis plastica, fibroid induration, and inflammatory narrowing of the stomach. Aschoff, in the latest edition of his work on pathology, describes cirrhosis as a sequel of chronic catarrh, the fibrous thickening extending from the mucous membrane to the other coats; Nothnagel, on the other hand, believes that it originates in the peritoneum and then spreads inwards. It is to be borne in mind that pathologists are handicapped in the study of affections of the stomach by the bad state of preservation in which this organ comes under observation in the *post-mortem* room. Leith (Allbutt's *System*) refers to cirrhosis as one of the rarest of stomach affections, and gives a good description of its pathological anatomy, without, however, committing himself as to its origin. In a case observed by him the fibromatosis extended throughout the whole of the gastro-intestinal canal, excepting the duodenum and upper part of the jejunum. Quite recently Poncet, Leriche, Mouriquand, and Villard, of the Lyons school, have contributed a number of articles on inflammatory narrowings of the pylorus; they appear to be of opinion that the lesion is usually, if not always, tuberculous in character.

Surgeons have given little attention to the condition, although it is probably implied in the reports of cases where a pyloric tumour believed to be cancer has disappeared after gastro-enterostomy. I am sure many surgeons have met with it as a source of difficulty in performing gastro-enterostomy, the sclerosis and the fixation of the mucous membrane interfering with the application of the sutures.

Fibromatosis is not to be confused with the cicatricial induration which is so common at the base of a chronic ulcer, although the two conditions frequently co-exist. The most characteristic feature of the fibromatosis is its capacity of spreading, not only throughout the stomach but to other organs which may be brought into contact with it, particularly the colon and the pancreas. This suggests an infective or toxic origin, which receives support from its frequent association with ulcer.

Naked Eye Appearances.—All surgeons who have given the matter some attention will agree that the external appearances of the fibrosed stomach are extremely like cancer. The portion of stomach affected presents all the characteristics of a new growth; it forms a tumour-like mass, hard and well defined; when free from adhesions the peritoneum may present a white or even a pearly appearance that one used to look upon as characteristic of cancer. Both in cancer and in ulcer-fibrosis, the

lymphatic glands may be enlarged, and present precisely similar characters. When the stomach is laid open, the

Fig. 1.—A portion of stomach resected for cancer and found to be so. Microscopically it is a columnar epithelioma undergoing colloid degeneration.

resemblance to cancer to a large extent disappears; there is no appearance of new growth from the mucous

Fig. 3.—Cross section of pyloric end of stomach and colon, natural size. In the centre is seen a chronic ulcer, and extending from this there is fibromatosis round the entire circumference of the stomach and in the adherent portion of the transverse colon.

membrane in fibromatosis. In cancer, on the other hand, there is nearly always a visible growth in the mucous membrane, and very frequently this takes the form of cauliflower-like, fungating masses. Unfortunately, with the clamp method of operating, the interior of the stomach is not seen until the resection is completed.

If the affected portion of stomach is cut across it will often be observed that in cancer the distinction between the different coats is obliterated; in fibromatosis it is more pronounced than in the normal stomach. In cancer the main increase in thickness is in the mucous membrane; in fibromatosis it is most frequently in the submucous coat.

The condition of the mucous membrane varied widely in different cases. In all of my own specimens there was a chronic ulcer in the centre of the fibrosed area. I was astonished at the size of the ulcer; it frequently extended more than halfway round the circumference of the stomach. In some cases the mucous membrane was reduced to a mere film of granulation tissue, presenting to the naked eye a smooth, atrophic appearance. In the contracted forms of fibromatosis the mucous membrane is thrown into folds similar to, but rarely so well marked as, those observed in fibromatosis of the colon and rectum.

One of the characteristic features of fibromatosis, and one which differentiates it from the common cicatricial induration at the base of an ulcer, is its capacity of spreading widely from its point of origin.

In one of my own cases (Fig. 3) there was a chronic ulcer at the pylorus, and the fibromatosis which had commenced at the site of the ulcer not only extended round the entire circumference

Fig. 2.—Diffuse fibromatosis in the pyloric end of a stomach resected for cancer. The section at the pyloric end shows the great increase in thickness of the submucous coat, which by its contraction has thrown the mucous membrane into folds.

of the pyloric portion of the stomach, but also round the transverse colon, which was adherent to it. This condition of affairs added to the already close resemblance to malignant disease, so that I had no hesitation in resecting both stomach and colon; fortunately the patient made a good recovery.

When the fibromatosis extends throughout the whole stomach the viscus is smaller and heavier, it does not collapse when opened, and the general appearance has led to its being called the "leather bottle stomach." This condition is illustrated in all our larger museums, the best-known specimen being that in the Royal College of Surgeons of England, because it has been so frequently figured by Mayo Robson as an example of diffuse carcinoma. I have not had the opportunity of examining this specimen microscopically, but I have no hesitation in concluding from the naked-eye appearances, and their close similarity

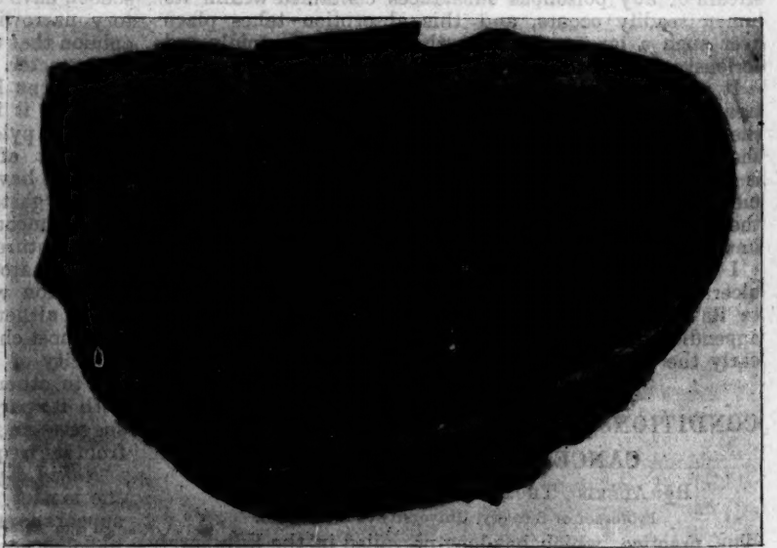

Fig. 4.—Generalized fibromatosis or "leather bottle" stomach. The differentiation of the different layers of the stomach wall is well brought out, and owing to contraction at the pylorus, the muscular coat is hypertrophied. (Anatomical Museum of the University of Edinburgh.)

to the specimens I have myself examined, that it is really a diffuse fibromatosis.

The hypertrophy of the muscular coat which is visible to the naked eye is accounted for by the contraction at the pylorus. I am aware that the "leather bottle" stomach has been usually regarded as the result of an atrophic scirrhus; my own observations negative this view, and I may add that in all the cancers of the stomach which I have examined there was not a single instance of atrophic scirrhus.

Fig. 5.—Fibromatosis in the submucous coat close to the edge of a chronic ulcer. Only isolated remains of the muscularis mucosae are seen.

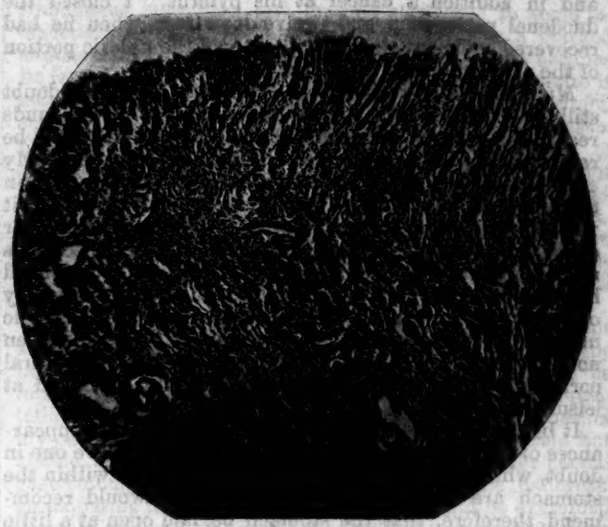

Fig. 6.—The mucous membrane overlying the fibromatosis from the same preparation as Fig. 5 under a higher power. Only the remains of gland-tubes are seen.

The Changes in Gastric Fibromatosis as seen with the Microscope.—In the majority of the specimens examined the *mucous membrane* was the seat of ulceration, that is to say, it was chiefly composed of granulation tissue, the capillaries of which come up close to the surface, while many of the cells are of large size and appear to be of the nature of phagocytes. Most of the gland tubules disappear, but here and there isolated remains of them are seen in the midst of the granulation tissue. The *muscularis mucosae* is thickened and the muscular bundles of which it is composed are segmented off from one another by granulation tissue. (Figs. 5, 6, and 7.)

The *submucous coat* is the main seat of the fibromatosis. In a few cases, apparently of recent origin, the thickening is due to granulation tissue. In those of longer standing—and these comprise the great majority—the new tissue is composed of fully formed white fibrous tissue and well-formed blood vessels. The fibres are wavy, they run in all directions, and are not closely packed. Between them there are abundant fibroblasts. There are no elastic fibres, and Weigert's stain does not bring out any change in the nerve fibres. In some specimens, apparently those of long standing, the blood vessels show endarteritis.

Fig. 7.—Fibromatosis associated with chronic ulcer extending throughout all the coats. The mucous membrane is represented by a thin film of granulation tissue. The walls of the blood vessels are greatly thickened. At the lowest part of the field is seen a lymphatic gland.

The *muscular coat* may show a simple hypertrophy consequent on narrowing of the pyloric outlet; in the majority the fibromatosis extends between the bundles of the muscular coat, separating these from one another, and, it may be, completely replacing them.

The *serous* and *subserous coats* may also be the seat of an extension of the fibromatosis, and the stomach is then usually adherent to the parietes or to some adjacent viscus, such as the colon or pancreas.

One of the specimens of fibromatosis given me by my colleague, Mr. Caird, showed a remarkable combination of ulcer-cancer and tuberculosis. The fibromatosis mainly affected the subserous coat, and measured fully half an inch in thickness, and showed a number of the most perfect giant-celled systems. The mucous membrane was the seat of an ulcer, in the granulation tissue of which there were numerous giant cells and also a proliferation of the glandular epithelium, which was obviously engaged in invading the submucous coat. In this particular instance the tuberculous infection appeared to have preceded the ulcer-cancer.

So far as I have observed, the cancer which follows on ulcer is always a columnar epithelioma, and the microscopical changes are very similar to those in ulcers which become the seat of cancer in other parts of the body. I think I am also justified in saying that ulcer-cancer takes a much longer time to infect the surrounding parts than the common forms of cancer of the stomach.

Clinical Differentiation.—The clinical differentiation between fibromatosis and carcinoma resolves itself mainly into the differentiation between chronic ulcer and carcinoma—a subject which is beyond the scope of this article. It may be said, however, that loss of appetite, progressive loss of weight, disappearance of free HCl, and the presence of a palpable tumour, may be combined in ulcer-fibromatosis as they may be in cancer.

At the Operation.—As a rule there will be no difficulty in differentiating between the two conditions at the operation. There will be less liability to confuse between them if one realizes the possibility of error, and one remembers that the mistake is always made in the same direction, believing the disease to be cancer when it is not. I was

formerly inclined to regard involvement of the duodenum as supporting the non-malignancy of the gastric lesion, but a case under my own observation showed that this reasoning is not to be trusted. The patient, a man aged 52, had suffered from gastric symptoms for two years, and was then seized with acute perforation. On opening the abdomen I found that he had a perforated duodenal ulcer, and in addition a cancer at his pylorus. I closed the duodenal perforation, and twelve days later, when he had recovered sufficient strength, I resected the pyloric portion of the stomach.

Microscopical Examination.—In cases in which a doubt still exists as between cancer and fibromatosis, it sounds reasonable as well as scientific that a portion should be removed for immediate microscopical examination. My experience leads me to say that I have very little faith in the results of this hurried examination. In some cases it will clear up the difficulty, in others it will leave room for doubt. In a considerable proportion of the specimens upon which I have been working it required a prolonged histological investigation before one could decide definitely one way or the other; this is especially true of chronic ulcers which become the seat of cancer. The specimen not only requires to be carefully hardened, but several portions of it may have to be sectioned and examined at leisure.

It has already been pointed out that the external appearances of the stomach are those most likely to leave one in doubt, while the appearances as viewed from within the stomach are much more illuminating. I would recommend, therefore, that the stomach be laid open at a little distance from the tumour, and the interior examined, certainly with the fingers, and, if possible, with the eye; this should enable one to differentiate between chronic ulcer with fibromatosis and the common forms of malignant disease. In the case of ulcer-cancer we should have greater difficulty, and the possibility of its occurrence supports the argument for advising resection as the best treatment of chronic ulcer of the stomach, whether a gastro-enterostomy is performed or not. There is not the same indication for resecting chronic ulcer of the duodenum, as it presents no tendency to malignant transformation.

CONDITIONS SIMULATING CANCER OF THE STOMACH.

By F. D. Bird, M.B., C.M.,

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The surgeon's task in the treatment of stomach disease is not nearly so simple as it appears to him who advises an exploratory operation. It has become easy to perform gastro-jejunostomy, gastrectomy is almost commonplace, but the choice of what to do is to my mind often most difficult. An exploratory operation should explore with, if possible, a resulting finality. Now, finality cannot be reached by mere feeling through a small opening, unless there is a multitude of cancerous nodules scattered about, and even this may very closely be mimicked by a hydatid efflorescence. Again, what surgeon is omniscient enough to decide with certainty between ordinary carcinoma, chronic ulcer with induration and thickening, foreign body peritonitis round a small gastric perforation, ulcus carcinomatosus situated near the pylorus, syphiloma, chronic pancreatitis with adhesion and myxoma, with a forefinger in a small incision as his only guide? even with a larger incision which allows full inspection and freer palpation it is often difficult, and sometimes impossible without the assistance of a microscope.

It certainly seems a failure in the surgeon to have to close the abdomen without a definite diagnosis after what he is pleased to call an exploratory operation, yet this I am sure is not seldom his only correct procedure. The surgeon must rely on the microscopist for his ultimate diagnosis in a number of gastric cases.

It is in the early cases of carcinoma of the pylorus, of early fibroid thickening there, of young syphiloma of that region, that the surgeon can attain his highest usefulness, and it is here that his diagnostic powers, limited to sight and feeling, are most likely to fail him. The position is difficult, for when the physician has performed his chemical tests, has regulated the diet, has removed all sources of gastric hyperaemia without effect, when the bacteriologist has finished his leucocyte and serum tests, with results whose value we are only beginning to learn, it still remains for the surgeon to decide whether his exploration should be amplified into a gastrectomy.

In most cases unfortunately the cancerous nature is made manifest by the tag of growth creeping along the lesser curvature, but in a case which is suitable for gastrectomy or a very ample pylorectomy, how can the surgeon be sure he is not dealing with a syphilitic manifestation which in some of its forms produces a distinct, well-defined tumour, very alike indeed to the early cancer? The surgeon having but little time to spare sees a tumour which lends itself to removal, and he promptly essays his gastrectomy, which in a fair percentage of cases will, if the specimen be examined microscopically, be found to have been an unnecessary proceeding. Some years ago I with much satisfaction found and cut out what I thought was an early pyloric carcinoma admirably fitted for resection. My satisfaction evaporated on hearing the statements of Professor Allen and Dr. Mollison—both highly competent microscopists at the Melbourne University—that the specimen was a syphiloma. It can be seen in the Melbourne Museum with several others owning the same spirochaetal origin removed by colleagues and remaining as monuments to the difficulty of differentiating syphiloma from early carcinoma of the pylorus.

From the fact that early carcinoma gives rise to such slight symptoms, while syphiloma causes marked deterioration of health, with gastric disability, and on exploration reveals a circumscribed tumour inviting removal, I have little doubt that some of the successful cases of gastrectomy and pylorectomy alive years after these surgical proceedings were instances of operation for syphiloma and not for carcinoma. Again, in those cases in which a gastro-enterostomy has been performed as a palliative, with the pronouncement of a cancerous diagnosis, and the patients have refused to pursue their cancerous natural history, it is likely that syphilis was the cause of the mistake in prognosis. Being much impressed with these cases, I became alert to the possibilities of syphilis as a cause of definite tumour simulating cancer of the pylorus. The following is a case in point:

I was fortunate enough to be sufficiently suspicious of the real nature of a pyloric growth, in a man under 35 years of age, to be content with removing a piece of the growth and one of the circumferential glands instead of performing the partial gastrectomy which seemed amply justified. Dr. Mollison assured me of the syphilitic nature of the pieces removed, and the patient was placed upon vigorous antisyphilitic treatment, with, for a time, excellent results. However, the symptoms pointing to pyloric obstruction became prominent again, and he allowed me to reopen his abdomen with a view to performing gastro-enterostomy. This was done because the stenosis at the pylorus was marked, but the tumour itself had almost disappeared, the pylorus presenting an entirely different appearance from that seen at the previous inspection, although but four months had elapsed. The perigastric glands, which had been pink, swollen, and evidently irritated, were much less obvious, and did not obtrude themselves on the attention in the way that they did at the first operation. This patient was kept under observation for over three years, and though he had to be careful with his diet, he had no further gastric symptoms. He benefited much from occasional courses of antisyphilitic medicine, without which he became anaemic and lowered in general health.

Other similar cases could be adduced from my notes if space permitted, and that syphilis can form a definite circumscribed tumour at the pylorus I have no doubt whatever. These tumours invite removal by their circumscription, by the absence of an extension from them along the lesser curvature; both surgeon and anaesthetist are anxious for a decision, as gastrectomy is not a short operation; to reopen the abdomen seems inartistic surgery, and yet in many cases I hold it is the proper course to limit one's effort to cutting out a small piece of the tumour and a gland for microscopical examination. This unheroic action will not very infrequently save a superfluous gastrectomy, and in other cases which appear to be carcinoma too far advanced for operation the microscopic finding may prevent the patient going to his grave labelled gastric carcinoma when he is really suffering from syphiloma of the stomach, which in some cases will kill him as surely if drug treatment is withheld. These syphilomatous growths may occur at other parts of the stomach wall, simulating mural cancer, and they may be ulcerated on their inner aspect. One of the two which

I have seen which were not at the pylorus was situated on the anterior gastric wall and greater curvature, and had glued itself on to the parietal peritoneum, and was implicating the fibrous and muscular structures of the abdominal wall.

How can we tell that our exploration has exposed a syphilitic growth? The previous history hardly gives earnest of a clinical individuality. There is pain at times, loss of strength and anaemia, wasting and gastric disability. Of haematemesis I can speak but little, and not at all of cryptic haemorrhage in the faeces; but when the abdomen is opened we may find help to a diagnosis from concomitant syphilitic evidences elsewhere than in the stomach; thus there may be whitish blotches and markings on the peritoneum, notably on that covering the spleen and the liver, on the parietal peritoneum, and that forming the round ligament. I have learnt to look upon purposeless scars and adhesions in the great omentum as very likely to be syphilitic.

If such stigmata are seen, I am sure that a suspicion of syphilis should enter the mind of the surgeon sufficiently strongly to stay him from performing an operation of prime severity at once. The look of the tumour may arouse doubt also, especially if it has been present but a short time; it is more succulent looking, almost opalescent, than sarcoma or carcinoma, but the older it is the more it resembles these growths, a development which is true of gummata in other parts of the body.

If microscopical evidence and therapeutic test and clinical success are sufficient, I am justified in speaking with the certainty I affect of these cases of what I firmly believe to be syphiloma of the stomach, always supposing that there is not a micro-organism akin to the *Treponema pallidum*, which produces similar tumour effects.

This subject has interested me for years, and but very little of my experience of it have I been able to bring under the Wassermann test, of which I think the surgeon should avail himself before exploring the upper abdomen, if syphilis is a commoner cause of disease here, I firmly believe, than is at present recognized.

The points I wish to labour are these:

1. The possible uncertainty of explorations without the assistance of the microscope.
2. That a very few cases simulating cancer of the stomach are due to hydatid and myxoedema.
3. That a not inconsiderable number are the result of syphilis.
4. That when syphiloma of the stomach exists and is unrecognized on exploration one of three results ensues—either an unnecessary gastrectomy is performed, or a hopeless prognosis of cancerous death is made and the patient dies of his syphilis, or with the same prognosis he refuses to die and regains moderate health after explorations, for the virulence of these syphilomata varies widely.

Please do not think that I speak against explorations. I am one who believes that in a case with symptoms pointing to the upper mid-abdomen, after a month's unavailing treatment at the hands of the physicians an exploration by sight and touch of the allied organs, stomach, pancreas, and liver, should be made, but in some cases this will not be enough to establish the diagnosis without the microscopic pronouncement on a piece of the tumour removed for the purpose.

In addition, operation, I take it, helps the action of the drug treatment in the absorption of the syphilitic material.

THE EARLY DIAGNOSIS AND TREATMENT OF CANCER OF THE STOMACH.

By Herbert J. Paterson, M.C., M.B.Cantab, F.R.C.S., London.

It is, perhaps, hardly realized that, although the stomach is more frequently affected with cancer than any other organ in the body, gastrectomy (partial or otherwise) is one of the uncommon operations in surgery. This is not as it should be, for gastric cancer in its early stage is markedly a local disease, and can be removed with favourable results, both immediate and remote.

It is possible that many of our profession do not yet realize these facts, and the object of this paper is to bring out some points in the early diagnosis of the condition and the present-day results of surgical treatment.

The Early Symptoms.

At present we know of no pathognomonic symptom, and have to depend on careful study of the clinical symptoms, together with a thorough investigation of the gastric contents. The earliest of the former are loss of appetite, failure of strength, and anaemia.

Loss of appetite is usually gradual and insidious, but in some cases is sudden, and may be attributed to some indiscretion in diet. In many instances there is a marked aversion from meat. The patient refuses food, not because he fears it will cause him pain, but because his appetite is gone. Progressive loss of strength is an early symptom, sometimes the first to attract attention, and is often associated with impaired mental activity and depression of spirits. As a rule, even in the early stages, a slight but increasing degree of anaemia is present. In some cases this is the earliest symptom of the disease. In my experience such cases run a very rapid course, and are usually beyond the reach of surgery before a diagnosis is made. Fortunately, however, such form only a small proportion of all the cases.

A palpable tumour is not an early sign of cancer. Our aim should be to establish a diagnosis, or at least the necessity for surgical treatment, before a tumour can be felt. Nevertheless, a palpable tumour by no means contra-indicates the possibility of a complete removal. In one of my cases there was a large tumour not only palpable but visible, but the patient lived nearly four years after partial gastrectomy with removal of a portion of the pancreas. In palpating for a tumour the abdomen should be examined not only after emptying the stomach, but after distending it with air. In some cases in which this is done a hardening can be felt in the region of the pylorus, probably due to a spasm of the pylorus set up by the distension. When present this is an indication, not necessarily of cancer, but of the necessity for surgical treatment.

The Gastric Contents.

There are many who do not attach much importance to gastric analyses. I am not one of these, for I believe that when interpreted in connexion with the clinical history of the case they are of the greatest help, often the chief aid, in assisting us to come to a conclusion as to the necessity for surgical treatment.

The two most important points are:

1. Evidence of impairment of the motor functions of the stomach.
2. A diminution of the chlorides in the gastric juice.

1. In about 65 per cent. of cases the disease begins at or close to the pylorus. It follows, therefore, that one of the earliest signs of cancer of the stomach is impairment of its motility. The simplest way in which to estimate this is to give the patient 12 oz. of milk overnight, and then pass a stomach tube ten hours later. By this time the stomach should be empty. The presence of food remains indicates impaired motility. If, on making this test, about 50 c.cm. or over of fluid containing food residues is drawn off, we are pretty safe in concluding that there is some condition present rendering an operation advisable. Persistent impairment of the gastric motility is a condition requiring surgical intervention.

2. In 1842 Golding-Bird pointed out that free hydrochloric acid is often absent in cases of gastric cancer. For a time this was regarded as a sign pathognomonic of cancer. We now know that this is not the case. This sign, like many others, has "been weighed in the balance and found wanting." Free hydrochloric acid is absent in many other conditions. Of much greater importance is the diminution of the protein hydrochloric acid. A marked diminution of the protein hydrochloric acid is in my experience a very early symptom of gastric cancer. It is true that in chronic gastritis due to other causes than malignant disease there is a marked diminution of the protein hydrochloric acid, but in estimating the value of this sign we must consider its importance in relation to the clinical history. Chronic gastritis secondary to cancer progresses much more rapidly than gastritis due to other causes. The relation of the degree of diminution of the protein hydrochloric acid to the duration of the patient's symptoms must be considered. In other words, marked impairment of gastric motility, or marked diminution of protein hydrochloric acid in a patient over middle age raises a suspicion of malignancy, and the shorter the history and the greater

the degree of gastritis as shown by analysis, the greater the probability of cancer. Let me illustrate this by two analyses of the gastric contents of two patients, neither of whom had any palpable tumour.

The first analysis refers to a man who had suffered from gastric symptoms for a year. Total acidity, 44; total chlorides, 0.206; free HCl, 0.000; protein HCl, 0.082; mineral HCl, 0.124.

The chemical findings in this case are those of chronic gastritis with a very marked diminution of the protein hydrochloric acid. This might be due to inflammatory disease or to cancer. The comparatively long history, and at the same time fair condition of the patient, and the absence of any degree of anæmia were against malignant disease. Cancer of such long standing should have resulted in a much lower total acidity, and probably even more marked dimiuntion of the protein hydrochloric acid. At the operation a gumma of the liver was found which had become adherent to and involved the plorus.

The second analysis is that of the gastric contents of a woman who had suffered from gastric symptoms for four months. Total acidity, 29; total chlorides, 0.185; free HCl, 0.000; protein HCl, 0.070; mineral HCl, 0.113.

In this case the degree of gastritis was rather greater than in the first case, and yet the history was much shorter. This coupled with the fact that the patient had evidently lost flesh and was slightly anæmic led to a diagnosis of carcinoma, which was confirmed by operation and successfully removed. I have not yet met with a case in which the protein hydrochloric acid was about 0.100 or less in which there was not some condition requiring surgical treatment.

I am convinced that a good many cases are overlooked because under dieting and rest the patient improves temporarily and puts on weight. It is not uncommon in hospital notes to find a record such as this:

The patient was admitted for supposed cancer of the stomach, but under medical treatment gained in weight and was discharged much improved.

Not infrequently such improvement is but temporary, and later the patient again comes under observation with obviously inoperable gastric cancer. I have observed a patient with cancer of the stomach put on as much as 4 lb. in ten days. Such improvement, of course, occurs only in early cases, before the disease has spread beyond the limits of the pylorus—just those cases, in other words, which would be most benefited by operation. I wish, therefore, to lay particular emphasis on this point—namely, that gain in weight and temporary improvement under medical treatment and rest in bed is no contraindication to cancer of the stomach.

Fortunately it is not necessary to make a definite diagnosis of cancer in every case. All we need do is to ascertain that a condition is present which required surgical treatment, and this I maintain is quite possible with the means at our disposal. I am as averse as any one from making exploratory operations for diagnosis. At the same time I think the really reckless man is not he who explores after carefully considering the clinical history and results of gastric analysis, but he who adopts the policy of "wait and see" until the possibility of performing a radical operation is gone for ever. When once we are satisfied as to the probability of cancer, the risk of abdominal operation is less than the risk of delay.

It would be outside the limits of this paper to refer to the difficulties in deciding after the abdomen is opened whether a given pyloric swelling is malignant or inflammatory, further than to say that in several instances I have found the gastric findings very helpful. In three cases in which, after opening the abdomen, the disease appeared to be malignant, but in which gastric analysis pointed to the contrary, I acted on the strength of the gastric findings, and the subsequent history justified my confidence in gastric chemistry.

Neither have I said anything about the gastroscope as an aid to diagnosis, because, although it is an exceedingly ingenious and interesting instrument scientifically, I am very doubtful whether it will help us much in the diagnosis of cancer. Considering how difficult it sometimes is to decide whether a swelling is inflammatory or malignant, even when we can both feel and see, I do not think we can expect much help from an instrument which aids us by sight alone.

Method of Operating.

Carcinoma of the stomach is no exception to the general rule that the wider the excision the better are the ultimate results. In the ideal operation at least 1 in. of the duodenum and two-thirds of the stomach should be removed, together with all the glands along the lesser curvature as high as the origin of the gastric artery, the jejunum being anastomosed either to the anterior or posterior wall of the stomach. I have always, when performing a gastrectomy in one stage, adopted the plan I advocated in 1904—namely, performing the anastomosis of the jejunum of the stomach before I perform the resection. The advantages of the plan are:

1. The anastomosis is easier before the resection has been performed.
2. If the patient does not bear the anastomosis well the resection can be postponed until a later date.
3. There is less risk of the anastomosis being performed with undue hurry if it is done first.
4. In cases of doubt, a piece of the growth can be removed and examined microscopically while the anastomosis is being performed.

I would point out, however, that an examination of this sort, if negative, does not disprove the presence of cancer. To be of value the microscopical examination must be positive.

In early cases it is sufficient to remove the gastro-colic omentum as close to the colon as possible, but in later cases in which the glands along the greater curvature are enlarged, it is in my opinion advisable, in order to guard against recurrence, to remove the transverse colon as well.

I have repeatedly observed the spread of cancer cells along the gastro-colic omentum, and after removal of the stomach the patient may die later from a small growth in the colon or its neighbourhood. I have seen several instances of this, and one occurred in my own practice some years ago. A patient came back to me about three and three-quarter years after partial gastrectomy with a large fixed mass in the umbilical region. I regarded it as an inoperable mass of new growth. Some months later she was suddenly seized with severe abdominal pain, and died a few hours later. On examination I found the mass was inflammatory round a stercoral ulcer secondary to a large faecal accumulation produced by a small carcinomatous growth in the transverse colon, which could easily have been removed. If in this case I had removed the transverse colon at the same time as I removed the stomach I think it is reasonable to suppose that the patient would have been permanently cured.

Only a short time ago I opened the abdomen of a patient with gastric cancer, which seemed to be very suitable for removal, but on examining further I found a tiny nodule of growth in the transverse colon, a nodule so tiny that it might easily have been overlooked.

I do not wish to be misunderstood. I think progress is to be made not by extending our operative measures but by earlier operation. At the present time most cases are not seen by the surgeon until the disease is fairly advanced. I regard resection of the stomach as a futile operation if any cancer nodules are left behind. If the glands along the greater curvature are enlarged it is almost certain that the disease will recur unless the transverse colon and the omentum are removed.

Our aim, however, should be to attack the disease at a stage when this addition to the operation is unnecessary. Mr. Groves has recently suggested that the gastro-colic omentum should be stripped off. While I think this an additional guard against recurrence, my opinion is that if any addition is necessary to the ordinary operation, the addition should consist of removal of the colon.

When resection of the colon is decided on, the operation should always be performed in two stages. A gastro-jejunostomy and ileo-colostomy at the first operation, and resection of the stomach and colon three weeks later.

I must confess that of late years I have been increasingly drawn to the plan of performing partial gastrectomy in two stages—as originally proposed by Tupolske in 1891. Most patients with gastric cancer are in poor condition for any operation, and often even a simple gastro-jejunostomy is as much as they can stand in addition to the examination of the growth. Indeed, it is often only some hours after the operation that one realizes how little vitality they possess. After a preliminary gastro-jejunostomy they rapidly improve, so that in two or three weeks' time they are much better subjects for resection. It must be admitted that the preliminary gastro-jejunostomy does to some extent increase the difficulties of the subsequent resection, but these are outweighed by the greater safety of the two-stage operation, and in this, as in all surgery, the safety of the patient is our first consideration.

Personally, I do not believe in attempting resection in advanced cases. My rule is this—if, after opening the abdomen, I am in doubt as to whether I can get wide of the disease, I do not attempt to perform partial gastrectomy. A palliative gastro-jejunostomy is in my experience of no benefit except when there is vomiting due to definite pyloric obstruction.

The Results of Operation.

(*a*) *Immediate.*—In the hands of those who have had experience of gastric work the mortality of partial gastrectomy varies from 14 to 20 per cent. The mortality-rate in the cases operated on by the distinguished brothers, W. J. and C. H. Mayo, is 13.5 per cent. I would point out, however, that in their series of cases there are a certain number of very late cases. The great majority of deaths after operation are due to the fact that the patient's resistance is so diminished by the disease that the margin of safety is reduced to a very low point, and I venture to think that if we could get our cases reasonably early the mortality would not be greater than 10 per cent.

(*b*) *Remote.*—In my Hunterian Lectures I collected a number of cases of gastrectomy and showed that, of the patients who recovered, 24 per cent. were alive and well three years after operation, and 15 per cent. alive and well five years after operation. I believe that now a more extensive removal is being practised the results are even better. Leriche has reported 89 patients alive and well three years after operation, and of these 34 were alive and well five years or more after operation. Personally, I can point to one patient alive and well six years after operation, one lived nearly four years, another nearly three and a half years, and another is alive and well nearly three years after operation. Most of the patients who die from recurrence die within three and a half years, so that if a patient lives five years after operation for cancer of the stomach there would seem to be a strong probability of cure. Putting the matter into figures, I think we may fairly estimate the possible chances of a patient upon whom a wide removal of gastric cancer is performed by one skilled in abdominal surgery as follows:

Chance of recovery from the operation, 85 per cent.
Chance of living three years free from recurrence, 20 per cent.
Chance of probable cure, 12 per cent.

Conclusions.

Although I have insisted on the necessity for earlier diagnosis and earlier surgical treatment, I do not think that the great mortality from gastric cancer is altogether due to errors in diagnosis. While it is true that many cases are unrecognized until too late, it is equally true that many are unrelieved, either through the unwillingness of the patient to submit to operation, or to the reluctance of the medical man to urge it. At any rate, we as a profession cannot altogether escape some of the responsibility for the mortality from cancer of the stomach. My experience leads me to believe that in at least 10 per cent. of the cases which die without operation, the growth is found after death so localized that its removal would have been quite practicable.

What has been here said may be summarized as follows:

1. The number of operations performed for cancer of the stomach is far smaller than should be the case, considering the prevalence of the disease.
2. The reasons for this are, partly undue delay in making a diagnosis, and partly the reluctance of medical men to advise operation.
3. In patients in the middle period of life marked chronic gastritis and food retention is an indication for surgical treatment.
4. The minimum operation would consist of removal of two-thirds of the stomach with the glands along the lesser curvature, and 1 in. of the duodenum.
5. In later cases it is advisable to remove the transverse colon and great omentum.
6. Operation in two stages is safer than the performance of the whole operation at once.
7. If there is any doubt as to whether resection can be performed wide of the disease, no radical operation should be attempted.
8. The immediate mortality of the operation in skilled hands is 15 per cent. We may hope that in the near future the mortality may with earlier diagnosis be not greater than 10 per cent.
9. At present, in about 12 per cent. of the cases operated on, there is a probability of permanent cure, and the end results as well as the immediate are slowly but steadily improving.

THE ACTION OF GASTRO-ENTEROSTOMY IN CASES OF GASTRIC AND DUODENAL ULCER IN WHICH THERE IS NO MECHANICAL DIFFICULTY.

By C. Mansell Moullin, F.R.C.S.,
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The enormous benefit that is derived from the operation of gastro-enterostomy in cases in which there is a mechanical obstruction, such as stenosis of the pylorus, goes without saying, and needs no proof. But in cases in which there is no difficulty of this kind I have often been struck by the strange disproportion between the extent of the lesions seen and the amount of benefit derived. Before the operation the patient suffers from chronic ill health, repeated attacks of indigestion, constant vomiting and pain, and occasional haematemesis. After the operation, if reasonable care in diet is observed, he is perfectly well. Yet at the operation the only lesion seen is a small ulcer in some part of the stomach or duodenum which appears to be well out of the way, or, less still, a superficial scar left by an ulcer so shallow that there has been no material degree of contraction. It is clea. that such a lesion as this cannot be the whole explanation, for of the benefit derived from the operation, its extent and its continuance, there can be no doubt.

The only clinical evidence hitherto available that there can be anything further beyond this comparatively trivial lesion, is the occasional presence of haematemesis, the frequent existence of an excess of free hydrochloric acid in the gastric juice, and sometimes hypersecretion. The only *post-mortem* evidence, in addition to the presence of the ulcer or the scar, is a few extravasations in the mucous membrane around, and perhaps some superficial erosions. But I have noted on many occasions during operations upon these cases that the condition of the mucous membrane during life is strikingly different from that which is usually described, and this has now been borne out much more fully by the use of the gastroscope.

The mucous membrane of the stomach after death is absolutely different from what it is during life. After death it is a thin, grey, flabby membrane, that hangs in loose folds. During life it is soft, vascular, and thick, and maintains its own shape. During fasting, the usual condition in which it is seen, it is absolutely different from what it is during digestion; and, as may be imagined, if the bounds of physiological activity are passed, and the mucous membrane is spurred on to pathological work, such as is evidenced by the presence of an excess of free hydrochloric acid, or excessive secretion, the difference is greater still. The mucous membrane is swollen and congested to the utmost, especially in those parts where it is thickest, softest, and most vascular, and where the lymphatic follicles are largest and most numerous. It bleeds with the slightest touch, and the blood pours from it. Extravasations seem to form everywhere in its substance with the very slightest provocation or none at all. Its surface is so soft and tender that the least irritation causes it to give way. Erosions which, if circumstances are favourable, develop into ulcers, make their appearance wherever it is touched or squeezed by the muscles that surround it; and if inflammation sets in, as it always does sooner or later around an ulcer or an abrasion, these effects are carried farther still. The gastroscope shows that this is no fancy picture. The wonder in such cases is not that haemorrhages and ulcers occur, but that the stomach is ever free from them. Ulceration is too often regarded as if it were a disease of itself. It is sometimes, but in the majority of instances an acute ulcer is merely a local accentuation of a more or less general pathological state of the mucous membrane. An acute ulcer, when it has once been formed, makes all the symptoms worse by the inflammation that attends it and perpetuates them; but no matter how prominent it appears to be, the ulcer, unless due to embolism or some other gross vascular lesion, is really secondary. With rare exceptions it is not until an ulcer becomes chronic that it can be regarded as a disease of itself—one that requires treatment directed only to the ulcer and nothing else.

It is this morbid state of the mucous membrane of the

stomach and first part of the duodenum, the existence of which could only be suspected so long as the evidence was limited to the altered secretory activity of the gastric mucous membrane and the presence of a few extravasations, that is responsible for nearly all the symptoms which are ordinarily laid to the credit of acute gastric ulcer, and in many instances for the formation of the ulcer itself. Haematemesis, in cases of acute ulceration, is caused quite as often by haemorrhage from minute lesions of the mucous surface around as from the ulcer itself. Haemorrhages are much more often the cause of erosions than the consequence. It is the extreme sensitiveness of the mucous surface, made so much worse by inflammation spreading from the abrasions, that is the main cause of the spasm of the muscles around the pylorus and the antrum; and this spasm, in its turn, is the main cause of the pain so characteristic of this affection. In short, it is not the ulcer, but the exquisitely hypersensitive and hyperaemic condition of the mucous membrane, which underlies all the symptoms. Pylorospasm, haemorrhage, ulcers, and erosions are effects, not causes, though they combine to make all the symptoms infinitely worse.

This morbid condition of the mucous membrane may be caused in many different ways: continually swallowing septic poisons from the mouth; excessive meat diet, dram drinking, especially of raw neat spirit on an empty stomach; taking inordinate quantities of vinegar; exposure to cold (the relation of cold to the recurrence of the symptoms of duodenal ulcer after even many years has often been remarked; but it is not the ulcer that returns, but the condition of the mucous membrane that gives rise to the ulcer); the absorption of toxins from an inflamed appendix (Paterson and Moynihan); gall stones (Fenwick); movable kidney, as I have noted myself on two occasions; and probably many others. Whenever it occurs, as may easily be imagined, it may lead to the formation of an ulcer; and whenever an ulcer follows, it makes this condition worse by the inflammation that spreads from it.

How, then, does the operation of gastro-enterostomy give such relief in these cases? It cannot give relief if the primary cause is allowed to persist, as, for example, the swallowing of septic poisons generated in the mouth, or the absorption of toxins from an inflamed appendix. But if the primary cause is removed or has ceased to work, the operation breaks the circle. The stomach empties itself at once through the artificial opening. The spasmodic contraction of the muscles around the pylorus and the antrum comes to an end. The pain ceases with it, for it is the spasmodic contraction which is the real cause of the stabbing and bursting pain of ulcer, not the contact of the acid with the sensory nerves on the floor of the ulcer, for there are none. The mucous membrane recovers its natural condition, the hyperaemia subsides, the morbid hyperaesthesia which perpetuates the symptoms goes with it, and the ulcer heals. If there is no inflammation, relief is immediate. If inflammation has already set in, it takes longer, and if there is an ulcer it has to heal; but the existence of an ulcer or of a scar is not necessary to make the operation a clinical success.

The presence of an excess of free hydrochloric acid is of importance for several reasons. It is evidence (and hitherto has been almost the only evidence) of the presence of this morbid condition of the mucous membrane. It lowers the vitality of the tissues with which it comes into contact, rendering them more likely to break down and ulcerate. And if an ulcer has been formed, it tends to prevent its healing. But the excess is only one of the results of the condition of the mucous membrane, and not even an invariable one. It may be relieved by giving alkalis, or sometimes by the regurgitation of the alkaline bile and pancreatic juice through the artificial opening into the stomach, but these cannot cure it. The only way to stop the excessive secretion is to bring the morbid working of the mucous membrane to an end. Whatever may have been its original cause, the excessive secretion is maintained and made worse by the pylorospasm and ulceration, the effects that it itself produces; and the most successful way in practice is first to find out and remove the primary cause, if it is still at work, and then, if the symptoms continue, to break the circle by performing gastro-enterostomy, which has the merit of succeeding where all else has failed.

EXCISION OF GASTRIC ULCERS.

By Edward Deanesly, M.D., F.R.C.S.,
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The object of this short paper is to suggest that the almost universal adoption of gastro-enterostomy as the operation of choice in the surgical treatment of simple ulceration of the stomach and duodenum is neither based on sound principles nor justified by results.

The condition for which this operation was first designed and practised was stenosis of the pylorus. A new route was provided for the food by a short circuit. The principle was obvious and simple, and the results continue to justify it. So excellent, indeed, were the results found to be in cases of non-malignant stenosis of the pylorus that an extension of the same operation was soon made to cases of ulceration in which there was no stenosis.

The immediate results appeared to justify this procedure also. Pain was almost invariably relieved at once. The power of taking and digesting ordinary food was often regained, and the healing of the ulcer was reasonably inferred in most cases and actually verified in some. New principles had then to be sought to explain the favourable results. Spasm of the pylorus was assumed to exist even when the ulcer was situated at a distance from it and the short-circuiting was supposed to obviate this hypothetical condition. Radiographic observations made by means of food mixed with bismuth on patients on whom gastro-enterostomy had been performed showed, however, that the food does not pass for long by the artificial aperture but by the natural pyloric route. Experiments on animals previously pointed to the same conclusion. New explanations have, therefore, been sought in the altered reaction of the food due to the flow of bile and jejunal contents into the stomach, which observation has proved to occur in all cases quite apart from the so-called "vicious circle," from imperfect methods of performing the anastomosis. Whatever may be the true explanation I think practically every surgeon of experience must admit that gastro-enterostomy does almost always produce at least temporary alleviation of the symptoms of gastric ulceration whether the pylorus is involved in it or not.

That the results of gastro-enterostomy, brilliant as they so often are, are by no means always permanent, every candid surgeon must admit. Leaving on one side regurgitant vomiting, which is now rarely seen after a properly executed gastro-enterostomy, what are the symptoms which must be considered to show probably or certainly that the ulceration has not healed? Haemorrhage is rare after gastro-enterostomy, if we exclude that which may occur during the first two weeks from operative causes. Nevertheless, it has been often recorded, and must be taken as positive proof of failure to procure healing of the ulcer. Perforation of the original ulcer or of a new one at variable periods after gastro-enterostomy has also been often recorded. Recurrence of pain is the most frequent symptom of relapse, and is extremely common, even in cases which in every other respect are very successful. The recurrent pain does not in all cases, or even in the majority, I think, point to an open ulcer. When it does so the pain is severe and burning and directly related to the ingestion of solid food. Complete failure of gastro-enterostomy to bring about the permanent healing of the ulcer is, therefore, a matter of strong inference in a certain number of cases, and of actual demonstration in some cases.

Is there any relation between the situation of the ulcer and the liability to recurrence of symptoms after gastro-enterostomy? My own experience suggests that there is, and I believe that the experience of most surgeons is so similar that we may accept as a maxim that the nearer the ulcer is to the pylorus the more favourable the effect of gastro-enterostomy, and vice versa. I have, therefore, thought it worth while to ascertain as far as possible my own experience in this respect. Owing to the difficulty of tracing after-histories, I am unable to give complete particulars of all my cases, but the following summary is at least suggestive.

During the past ten years I have been able to trace all but a small percentage of those gastro-enterostomies in which the operation was performed for pyloric obstruction (non-malignant) and for ulceration of the duodenum or

stomach in the immediate neighbourhood of the pylorus. In all of them there was complete relief of symptoms and in none has there occurred anything to suggest the formation of a fresh ulcer, or the reopening of an old one. On the other hand, of those cases in which gastro-enterostomy was performed during the same period for ulceration not involving the pylorus less than one-third were ascertained to be completely relieved from one to five years after the operation. Of the remaining two-thirds, one-third could not be traced, and one-third, after a period of relief, had a return of pain and vomiting. Two cases submitted to a second operation. In one the ulcer, which was situated in the centre of the posterior wall, was found completely cicatrized and the gastro-enterostomy was found still patent and in perfect position. The pylorus, which was patent, was occluded by suture and the vomiting afterwards ceased, but the patient continues to have pain after solid food, though her digestion and general condition are much better than before the operation. In the second case there was a return of pain, vomiting, and haematemesis seven months after the gastro-enterostomy. Two years after the operation the abdomen was reopened and the gastro-jejunal fistula found in perfect condition. The original ulcer was found unhealed on the small curvature and posterior wall not involving the pylorus. It was excised completely and the gastric wound sutured. When last heard of there had been no return of vomiting or haematemesis, and the patient is pursuing her occupation at the present time—seven years since the first operation. This case made a considerable impression on me, for it was not only one of my earliest experience of recurrence of gastric symptoms after a successful normal gastro-enterostomy, but it proved that even a quite perfect and uncomplicated gastro-jejunal fistula was no guarantee against recurrence of ulceration or even against haematemesis. Subsequent experience showed me that the ulcers which proved most refractory to gastro-enterostomy were those situated on the small curvature of the stomach involving both surfaces, and those on the posterior wall at a considerable distance from the pylorus. Both these positions are very common sites for chronic ulcer, quite as common, if not more so, than the pyloric and duodenal areas.

The obvious inference is that chronic ulcers not pyloric or duodenal should be excised, but up to the present this procedure has met with little support. Most textbooks either dismiss it or deprecate it. Several reasons are adduced against it. Theoretically the conditions which cause ulcers to appear or prevent their healing are, of course, not affected by removing the ulcer, and the operation of excision does nothing to prevent the occurrence of a fresh ulcer. Again, it is alleged that in a large proportion of cases the ulcers are not single and may be numerous. I do not know how far statistical evidence bears out this contention, but my own experience is that the great majority of chronic ulcers are single, and that more than two ulcers are very rare. The operation of excision has also been said to be unsuited for large chronic ulcers on account of the difficulty of approximating the stomach wound. This objection is purely theoretical and unsound. Unless the ulcer extends far upwards towards the cardiac end there is no difficulty in removing and resuturing any of the central part of the stomach.

The results of gastro-enterostomy in cases of pyloric and duodenal ulceration, whether with or without stenosis, have been so extremely successful in the hands of so many surgeons and in such large numbers of cases that it is undoubtedly the operation of choice for this condition. The operation is easy, safe, based on sound principles, and excellent in its results. None of these assertions can be made for gastro-enterostomy for ulcers which are not pyloric or duodenal. I suggest that the operation of excision of central ulcers is technically no more difficult or dangerous than gastro-enterostomy; that it is more rational theoretically; and that it should be the operation of choice. During the last twelve months I have excised the ulcer in every case in which it was not in immediate proximity to the pylorus. The cases were eight in number, the smallest ulcer being ½ in. and the largest 2½ in. in diameter. In the latter only was it necessary to make a complete bisection of the stomach. All the ulcers were on the posterior wall, and all involved the small curvature. The gap left by the excision was closed transversely so as to cause no stenosis. In the case of the large ulcer the floor was formed in its whole diameter by the pancreas, and when the latter was separated from it and the puckering of the stomach thus undone, the real size of the ulcer—that is, of the actual loss of stomach wall area—was seen to be nearly double the apparent size of the ulcer *in situ*. When the two portions of the divided stomach were sutured together after removal of the ulcer and a necessary margin of healthy tissue, the size of the stomach was diminished by about one-fourth. In spite of this the functional result up to the present is absolutely perfect, and digestion and appetite are better than ever in the patient's previous life. All eight cases recovered without the least trouble, and all are at present in good health and free from symptoms. The time that has elapsed is, of course, too short to prove the permanency of the cure, but for the reasons already given, and from my unsatisfactory experience of gastro-enterostomy in central ulcers, I intend to excise every case of this kind in future, in the expectation that the results will in all probability be better than those of gastro-enterostomy.

Lastly, I wish to advocate the excision of perforated gastric ulcers whenever possible, which I believe to be in the great majority of cases. In five consecutive cases of perforating pyloric or duodenal ulcer, all of which recovered, and none of whom has since suffered from gastric symptoms, I found no difficulty and several advantages in excising the ulcer. The resulting gap, being in perfectly sound and movable tissue, was easily sutured transversely to the gastro-duodenal axis in such a way as to cause no stenosis. The operation, in fact, resembled a pyloroplasty, the excised portion involving one-third to one-half of the circumference. So far from lengthening the time of the operation, the satisfactory closure of the stomach was actually made easier and more rapid. In perforations near the pylorus, whether on the gastric or duodenal side, I regard excision and suture as the best routine treatment, and far superior both in its immediate and remote results to gastro-enterostomy, which is sometimes recommended.

When the perforation is high up towards the cardiac end closure is always difficult, and the ulcer is usually too large to excise, but whenever the size of the ulcer and the mobility of the surrounding parts render it feasible, I believe that excision is the best and most rapid procedure, since the attempt to close the perforation by purse-string sutures passing through the indurated area is perfectly futile. I commend these considerations to those who are interested in this subject, because so far as I can gather from current literature they are opposed to the teachings of present authority.

THE CLINICAL MANIFESTATIONS, DIAGNOSIS, AND TREATMENT OF HYDATID DISEASE OF THE LIVER.

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Hydatid disease *(Taenia echinococcus)* more frequently affects the liver than all the other organs of the body put together. Thus, in a series of 420 hydatid cases taken consecutively from the records of the Royal Prince Alfred Hospital, Sydney, 267, or 63.4 per cent., were affected in the liver. Further, in 74 the peritoneum was affected, and of these many had been previously operated on for hydatid of the liver.

As regards sex incidence, female patients seem to be somewhat more liable to liver hydatid than males; the latter, on the other hand, suffer more from hydatid of the lung. Out of 215 males, 128, or 54 8 per cent., were affected in the liver; while of 205 females, 139, or 67.8 per cent., were so affected. The results of a statistical inquiry into the general incidence and fatality of hydatid disease, and the probable causes at work, are fully given in a paper by the present writer in the *Australasian Medical Gazette* of October 21st, 1907, and need not here concern us further.

Of the 132 cases here studied, the vast majority—137 cysts out of 156—were in the right lobe; probably this is because the right lobe is so much the larger of the two

Ninety cysts presented on the upper surface, 66 on the lower. In one case there was a cyst in the gall-bladder wall; in 3 there were gall stones, in 4 cholecystitis; in 1 case the gall bladder contained daughter cysts and pus.

SYMPTOMS.

General Symptoms.—These are due to toxaemia (*a*) from interference with the digestive tract; (*b*) from absorption of toxins produced in a dead and suppurating or infected hydatid; (*c*) in rare cases from absorption of toxins produced in an apparently healthy hydatid. The last condition is one of great interest, which, so far as my knowledge goes, has not yet been adequately studied. Furthermore, toxaemia may be produced after operation on a healthy cyst, even though the case may run an aseptic course. In these cases the hydatid rash and a remittent temperature, lasting four or five days, are well-marked symptoms.

Local Symptoms.—These are pain, swelling, and dyspepsia. Other complications may be met with, due to affections of the pleura or peritoneum, to pressure on the great abdominal veins, or to displacement of abdominal and thoracic viscera either by the size or the weight of the cyst. In a few cases the presence of an old dead and calcified cyst may lead to neurotic phenomena.

Pain.—In adults this is common; in children, rare. About 60 per cent. of adults complained of marked or severe pain. In about one-sixth of the adult cases the pain was so severe as to be comparable with that of biliary colic; in all these cases except four the cysts were deep in the surface of the liver, or presenting on its upper surface. In the other four cases one cyst had ruptured into the gall bladder, two were suppurating, and one showed old calcified cysts in the wall of the gall bladder. Where no pain was complained of by adults the cysts were usually on the lower surface of the liver. The pain is described as shooting, acute, dull, aching, stabbing, intermittent, or sickening. It was usually worse on exertion, such as moving the arm; stooping especially aggravated it; deep breathing often brought it on or made it worse. In many of the severe attacks vomiting occurred, and in one instance daughter cysts were passed per rectum a fortnight after a severe attack of colic. The usual site of the pain was in the liver. In eighteen cases it was in the right shoulder, in two in the left, and in one case it was referred to the right iliac fossa. Commonly the attacks of pain preceded the appearance of a swelling, in one case by as much as fifteen years. On the other hand, a hydatid may exist for many years without causing the slightest symptoms beyond an indolent swelling, and then, without apparent cause, it may suddenly start to grow, give pain, and even to cause grave constitutional disturbance, although at operation nothing is to be found to account for the change. The question of pain in connexion with hydatids is a difficult one. Probably several factors are at work. The most important seem to be: Subphrenic peritonitis, diaphragmatic pleurisy, stretching of the peritoneum, pressure on small bile ducts, infection of the gall bladder with micro-organisms, kinking and pressure on the bile ducts with stasis and concretion of the bile, and, in rare instances, the passage of fragments of cyst wall along the biliary canals. It cannot always be ascertained to which of these factors the pain is due; it is frequently observed in the case of an entirely healthy cyst with no surrounding adhesions or other apparent abnormalities.

Swelling.—This is an invariable symptom, which, however, is often overlooked or disregarded by the patient. One frequently meets with cases in which the patient has noticed a swelling for years, yet has sought no advice till the hydatid has ruptured, suppurated, or commenced to cause severe pain. A rounded swelling beneath the ribs, moving with respiration, dull to percussion, hard, or at least tense, often rather tender, continuous with the liver dullness, may be looked on as typical. What is felt may, however, not be the cyst at all, but merely the lower edge of the liver pushed downwards by a cyst on the upper surface, and it is frequently a matter of great difficulty to decide by palpation on the exact site of the cyst. There may be no definite rounded mass, but only general enlargement or displacement of the liver; this is especially the case where the cyst is on the upper surface. In a few instances, where the cyst is almost pedunculated, it appears as a smooth, globular, mobile swelling. The tension to palpation varies with the age and thickness of the walls; thus, in an old cyst, the wall is often excessively thick, and in these cases the hydatid feels densely hard from outside. The lower edge of the liver may sometimes be felt running continuously below the costal margin, and frequently this edge is unusually hard. The subcostal angle is often flattened, and the diseased side larger than the other. The thoracic viscera are by no means constantly displaced; the apex beat is often felt in its normal position. In these cases the cyst is usually on the lower surface of the liver. When, however, it grows upwards the thoracic viscera are more commonly displaced, but even in these cases the liver may be rather pushed downwards than the heart upwards. Epigastric bulging is a very characteristic sign of liver hydatid, and frequently there is a distinct furrow above the mass.

Hydatid Thrill.—This was observed eight times, or in about 5½ per cent. of the cases. Of these, one cyst was on the upper surface of the left lobe; the others were all on the lower surface of the right. In the first of these cases the cyst pointed towards the front. Only one of the eight contained daughter cysts. The conditions which cause the hydatid thrill are not very well understood, but it probably occurs only in thin-walled cysts in which there is comparatively little tension. Daughter cysts have nothing to do with it. It seems to be more easily elicited in cysts protruding into the abdomen than in those whose growth is in an upward direction.

Rapidity of Growth.—This varies greatly, without any apparent reason. The cyst may remain apparently quiescent for many years, and it may then suddenly take on rapid growth; it may grow slowly from the time of first observation, or it may grow with great rapidity from the first. In one case there was a perceptible increase between examination in the out-patient department and operation.

Digestive Disturbances.—These occur with great frequency. Nausea, vomiting, distension after meals, acidity, and heartburn are common complaints in hydatid disease. The cause of these would appear to be, at least in some cases, splanchnoptosis from the weight of the cyst; in others, reflex spasm of the pylorus.

Vomiting.—This was noted in 28 cases. It may occur after food, or independently thereof; sometimes it accompanies the attacks of intense colicky pain. Often it signifies some change in the welfare of the cyst, as sudden rapid growth, rupture, or suppuration.

Diarrhoea.—This only occurred twice.

Jaundice.—This was observed 14 times. It was generally intermittent, and accompanied the violent attacks of colic, but occasionally it was persistent. It was not always possible to observe any pressure on a gall duct; in one instance it was accompanied by profound wasting, and in another it was the only symptom present.

In *children* there was never any severe pain, and none complained of biliary colic. Probably the soft and yielding tissues offer less resistance to the growth of the hydatid than it meets with in adults. Three-fourths of the children suffered no pain; the mothers brought them for treatment on account of the swelling. In children the average duration of symptoms before operation was only eleven months, whereas in adults it was over two years.

The hydatid rash occurred in about 10 per cent. of the patients, and never except when hydatid fluid was absorbed. Usually this happens after operation, but it may also signify leakage from a cyst. A very small dose of fluid seems to be sufficient to cause the rash. Commonly it resembled urticaria, and was itchy, but it may also appear like scarlet fever or measles. Grave toxaemia occurred four times. The symptoms were wasting, sweating, and loss of weight, with profound cachexia in two cases. Recovery ensued after operation.

COMPLICATIONS.

Suppuration had occurred in 14 per cent. of those submitted to operation. It generally followed on some trifling injury to the cyst, such as sudden exertion, a blow over the liver, or a fall. One case occurred after parturition; three after operation on the liver. One of these operations was for gall stones; the other two for other hydatids. The commonest organism present was the *Bacillus coli communis*, but staphylococci were also found. In some cases the pus was apparently sterile, but unfortunately

no examination was done for anaërobic organisms. There is a tendency among Australian surgeons to distinguish between suppurating cysts, which are merely the subject of leucocytosis, and infected cysts, which have been primarily invaded by bacteria. This classification seems to me to be doubtfully correct; the presence or absence of anaërobic organisms should first of all be ascertained; and, secondly, it is possible that organisms may have been present and have killed the parasite, only to be themselves in turn destroyed by leucocytosis. The first change noticed in a hydatid about to suppurate is probably the presence of coagulable albumen in the fluid. This is always a sign of disease in the cyst. Healthy hydatid fluid contains extremely little coagulable albumen—not enough to show by ordinary clinical tests. If albumen is thus present, either the fluid has been contaminated or the hydatid is dying or already dead. A preliminary rigor is rare in suppurating hydatid. Commonly the first indication is aggravation of whatever symptom was present; if there had been no symptom, then pain appeared in the liver or shoulders, daily more severe, occasionally with remissions. Vomiting, wasting, remittent temperature, hectic, earthy complexion or jaundice, and prostration complete the picture. Operation is usually dramatic in its success. In one case metastatic abscesses were observed.

Rupture of the cyst is the gravest complication that can ensue, and is probably fatal, sooner or later, in the majority of cases, either by immediate peritonitis, or by multiple scolical infection of the peritoneum. It had occurred in about 10 per cent. of those cases submitted to operation. The cause is generally an injury, often apparently trifling. Mere muscular exertion, such as running or swimming, is, in some cases, sufficient to bring it about; or there may be no definite history of injury at all.

The fluid may escape through the diaphragm into the pleura or thoracic viscera, into the biliary passages, into the vena cava, into the urinary passages, into the gastro-intestinal canal, or into the general peritoneal cavity. Of the 14 cases here studied one was into the lung, resulting in sudden coughing up of hydatid fluid, with shortly afterwards vomiting of bile and pus from the stomach, so that evidently there were two perforations, one into lung, the other into the stomach; two were into the stomach, due one to sneezing, the other to coughing; and eleven into the general peritoneum. Three of the latter died of general peritonitis. In rare cases the escape may be extremely gradual, probably little more than capillary oozing. Around the fluid, as it leaks out, a thin adventitious membrane forms, which gradually distends, till it comes to lie in front of the whole abdominal viscera from the liver to the pelvis, though within the peritoneum. This adventitious sac is found on operation to be filled with thin syrupy fluid, containing pultaceous cottony material with amorphous remains of daughter cysts, and, in the only case which I have seen, live scolices in considerable numbers. The abdomen appears to be full of fluid, and the diagnosis from tuberculous peritonitis is a matter of some difficulty. This condition has been observed independently by Professor Watson of Adelaide, Dr. MacCormick of Sydney, and the present writer, but I cannot find any reference to it in any publication to which I have access. Rupture appears to be much more common in youth than in middle or old age. The usual history is that the patient has been in normal health until, after some small strain, there is a feeling as though something had given way inside, followed by symptoms of local or general peritonitis. General peritonitis is likely if the hydatid in bursting ruptures the biliary channel, localized if there is no such communication. Suppurating hydatids very rarely seem to rupture into the peritoneum, no doubt because of the dense network of adhesions which rapidly comes to surround them. The density of the adhesions in hydatid patients far exceeds anything that I have ever seen in any other cases. One would hazard the guess that the reacting power of the patient has been increased by the presence of the parasite. Both our cases of rupture into the stomach and of rupture into the gall bladder, however, occurred in suppurating cysts.

Pleurisy with effusion occurs in about 8 per cent. of cases, and must not be taken as implying rupture through the diaphragm.

Ascites was present in two cases, and disappeared after operation.

No daughter cysts were ever found in healthy hydatids, and I believe them to be evidence of death of the mother cyst. Does it die in propagating itself? Or do the scolices, when the mother cyst is dying, take on active growth in the attempt to preserve the continuity of the species?

In rare cases dyspnoea occurs; only one, apart from those who suffered from pleurisy, complained of this symptom.

Diagnosis.

Commonly the diagnosis is not difficult, if one is on the look-out. The following conditions may be confused with hydatid disease: Pleurisy with effusion; diaphragmatic pleurisy; liver abscess; cancer of the liver; gall stones, cholecystitis, and cancer of the gall bladder. I have also seen some difficulty caused by pyloric cancer and pancreatic cyst. It should never be forgotten that liver hydatid may, even when non-suppurating, be accompanied by great pain, resembling gall-stone colic, wasting, and earthy complexion. Valuable assistance may be given by the *x* ray, especially when the cyst points on the upper surface of the liver a characteristic dome-shaped shadow may be obtained, which differentiates the case from pleurisy. In hydatid disease the edge of the liver has rarely the dense hardness and nodulated character noticeable in cases of cancer. Frequently a bulge is obvious at the site of the cyst, and in cancer jaundice is deeper and more persistent. An enlarged gall bladder is usually somewhat lower than a hydatid cyst, is less tense, and often more mobile. The history may be of value in clearing up the case; thus, a hydatid cyst on the lower surface of the liver is, in my experience, usually painless or nearly so, which cannot be said of gall-stone disease. I doubt if it is possible by clinical methods to diagnose between deep-seated suppurating hydatid and ordinary liver abscess. The history may give one a hint. Exploratory incision is in either case imperative. Attempts have been made to obtain information from the examination of the blood. In some cases of hydatid marked eosinophilia is present; but it is so often absent as to be an uncertain sign.

A precipitin reaction has been worked out by Welsh, Chapman, and Barling, of Sydney.[1] It appears to be absent in cases of suppurating hydatid, and to that extent fails; but we have obtained a positive reaction in nearly all our cases. Professor Welsh has kindly given me his latest conclusions, which, based on a very large experience, may be taken as authoritative.

1. The precipitin reaction does afford evidence of some specific antisubstance in the blood serum, indicating a specific interaction between the parasite and its human host.
2. That in our experience a positive reaction is conclusive of hydatid invasion.
3. That in many cases the reaction is too slight to be conclusive in diagnosis; and this result is only to be expected in view of the long years that a hydatid may lie quiescent in the tissues, since in such conditions the amount of antisubstance is likely to be scanty.
4. That the marked variations and not infrequent absence of the eosinophile reaction are probably to be explained in a similar way.

Clinically, we regard, with Professor Welsh, a positive reaction as diagnostic, a negative as inconclusive. Weinberg has experimented in the direction of fixation of the complement. Flashman and Butler of Sydney have modified his process, and consider it a marked advance on former reactive methods. Their report appears in the *Australasian Medical Gazette*, vol. i, 1910. The process appears to be more troublesome than the Wassermann reaction for syphilis.

Prognosis.

The immediate mortality of liver hydatid at the Royal Prince Alfred Hospital over a series of many years has averaged about 6 per cent., but in the course of the last five years it has been reduced to between 1 and 2 per cent. The only cases which now die are some of those which were ruptured and a few which have suppurated. But the ultimate results are far otherwise. Some patients suffer from recurrent hydatid of the liver, and it is noteworthy that one-fourth of all cases of multiple hydatid infection of the peritoneum—a grave, almost malignant, disorder—have at some time been operated on for liver hydatid. We hold, therefore, that hydatid of the liver is to be looked on as a most serious disease, of which the ultimate

outcome is uncertain. Such cases should not be accepted for assurance for five years after operation.

TREATMENT.

No other means than operation can be considered nowadays. In all cases the mother cyst should be removed.

The possible methods of treatment of the adventitious cyst are as follows:

(*a*) Marsupialization.
(*b*) Allow it to drain into the peritoneum.
(*c*) Fill it with saline solution and sew it up.
(*d*) Obliterate it by sutures, as is done with the cavity left by myomectomy of the uterus.

In the present writer's opinion, marsupialization is the operation of choice. The objections to the other methods are as follows:

1. Bile canaliculi are frequently partly eroded by the pressure of the hydatid; these may give way after some hours or days, leading to the outpouring of bile into the peritoneum.
2. The liver may contain organisms from the portal system, which may become extruded into the vacant cyst cavity, and, if they reach the peritoneum, cause fatal peritonitis. It is notoriously difficult to keep liver hydatid cavities aseptic.
3. Mainwaring of Adelaide[2] has pointed out that exogenous formation of cysts, even in the liver, is by no means uncommon. These cysts should be allowed to escape outside, and not into the peritoneum.
4. Delbet's operation of suture of the adventitious cavity is excessively difficult—in my experience, usually practically impossible without a large incision. Furthermore, there is the danger of implantation of live scolices into the adjacent liver tissue.

The objections to marsupialization are as follows:

(*a*) Hernia may occur. In an experience of over a hundred cases I have never seen it.
(*b*) Convalescence may be protracted. The usual period, in my experience, is from three to six weeks. Those cases which require longer are those in which either there is imperfect drainage (that is, faulty operating), or in which the adventitious cyst wall is calcified or greatly thickened. Such cases are no better suited for any other method of operation.
(*c*) Adhesions may form. This objection applies equally to all the above methods.

With increasing experience I think every surgeon tends to attack these cases more and more from the back, usually through the pleura; better drainage is thus obtained, and there is less risk of general peritoneal infection. I should be inclined to express the opinion that the transcostal route is the route of choice, preferably, if possible, at the "bare area" of the liver.

The anterior route will be first described, as it is the simplest.

(*a*) Locate the cyst. This is often difficult, sometimes impossible.
(*b*) Anterior vertical incision, three inches long, over the prominent swelling. Open peritoneum.
(*c*) The cyst appears as a tense, yellowish, fibrous area on the surface of the liver.
(*d*) Carefully pack off all around with gauze pads.
(*e*) Inject 5 c.cm. of pure formalin with the finest aspirating needle thrust as deeply as possible into the cyst. The assistant carefully covers the minute puncture with his gloved finger.
(*f*) Wait a few minutes, meanwhile packing off the abdomen still further, with scrupulous care, and covering also the parietal wound. The best packing for this is sheets of rubber darn sewn into gauze pads.
(*g*) Turn the patient on his side, and have a large bucket ready. Stab rapidly the cyst with a knife, the finger following immediately, and hook the cyst as far as possible outside. Every one must stand clear of the fluid, which may gush forth with immense violence.
(*h*) Enlarge the wound in the cyst with the finger, and allow the fluid to escape; as it does so, draw the cyst further and further outside.
(*i*) When empty, remove the mother cyst with ovum forceps.
(*j*) Swab the inside of the adventitious cyst with 1 per cent. formalin. Examine the liver for other cysts. If quite near, puncture through the first with sinus forceps, enlarging orifice as required. If far away, leave to a subsequent operation.
(*k*) Sew edge of cut adventitia to aponeurosis of external oblique or rectus; not to skin. We use No. 3 iodine catgut.
(*l*) Drain with a large-holed rubber tube passed deeply into the cavity. If the cavity extends right back to the loin, make a posterior puncture opening, and pass the tube through that also.

After-treatment.—We usually put these patients on a verandah and allow them up in a fortnight.

Commonly there is an evening rise of temperature for three days. The tube should be left in while this occurs, but the sooner afterwards it is taken out the better.

It is seldom that serious difficulties are encountered. Occasionally there are adhesions, but these are rarely troublesome. The most difficult cases are those in which the cyst has presented at the transverse fissure of the liver, but very rarely does it cause real operative trouble. Cysts in this position are apt to press upon the bile ducts, causing early jaundice, so that they are discovered early; if the cyst be yet quite small, it may be difficult to bring it to the surface. Again, in very rare cases, such cysts may remain latent, causing great thickening of the adventitia in the course of many years—Watson's "leather-bottle hydatid"—and it will then give rise to a good deal of difficulty at operation.

When the hydatid is in the portal fissure, and the edges of the cavity cannot readily be lifted to the surface, the best plan is to incise the suspensory ligament of the liver; the viscus is then mobilized to a remarkable extent, and can be rotated on its transverse axis, so that even its posterior edge can be brought forward. I have never seen any ill result follow this. In course of time the liver seems to regain its normal attitude. If the cyst cannot even be approximately localized, an anterior exploratory incision is justifiable; but unless the cyst wall is definitely pointing on the surface of the liver when thus exposed, I think it wiser to close the anterior incision and attack it from the back, rather than make deep exploratory punctures into the liver from the front.

THE POSTERIOR OPERATION.

(*a*) Incision usually parallel to eighth rib; resect some 3 in. of eighth and ninth ribs. I usually do this from about the posterior axillary line forwards.
(*b*) Incise costal pleura; if the edge of the lung presents push it upwards. The risk of pneumothorax is very small; I have never seen it. If it should occur, the lung can easily be drawn out into position by compression of the ribs; but it would probably be wiser not to do this till the hydatid is empty, owing to the grave danger of intraperitoneal rupture.
(*c*) Incise diaphragmatic pleura and diaphragm; retract margins of the deep wound widely.
(*d*) The hydatid presents on the surface of the liver: stitch the edges of the diaphragm to the costal pleura all around the wound, so as to avoid pleural infection.
(*e*) Inject formalin, and treat exactly as before.
(*f*) The hydatid does not present. If necessary enlarge wound, removing sufficient ribs to obtain a free exposure of the upper surface of the liver.
(*g*) Palpate liver; where it is hardest introduce a large aspirating needle. When fluid is struck take off the syringe, leaving the needle *in situ*, and inject strong formalin as before. Remove syringe, still leaving the needle as a guide.
(*h*) Incision of the liver, alongside the needle, can be done with an ordinary knife. I have had to go through over 1 in. of liver substance before reaching the hydatid. Let out the fluid, as before; enlarge the wound in the liver with the fingers to the necessary extent; remove the cyst; stitch to the intercostal muscles, the sutures perforating the tough adventitious capsule as well as the liver substance.

Scrupulous care should always be taken to prevent any hydatid fluid from touching any raw surface. It may be infective—one never knows.

The after-treatment is much the same as for the anterior operation, except that we generally now let the patients get up on a couch at about the end of a week.

After exposing the hydatid, it has been suggested to aspirate it and then refill the cavity with 1 per cent. formalin solution. The objections to this course are as follows:

It leaves the parasite, even though dead, inside the patient. The cyst walls may be degenerated or contain calcareous plates, in which case it will be probably necessary to reopen the wound and to deal with a liver abscess. In nearly one-fourth of the cases there are more than one cyst; these may not be detected until after the first one has been cleared out, and for this reason the liver should always be palpated bimanually, with one or two fingers inside the empty cavity. Again, exogenous formation of cysts may have occurred, and it is very doubtful whether injection of formalin into the original cyst will kill those outside it. They are more likely ultimately to suppurate and give trouble. Finally, there may be intra-abdominal leakage from the needle puncture.

After careful review and trial of all the methods suggested, I believe that the original Lindemann operation is still the best for liver hydatid, provided that efficient drainage is secured, and that calcareous and degenerated patches are removed at the primary operation, by curetting if necessary. In certain other situations the newer methods may be preferable, but our present subject is hydatid of the liver.

Occasionally a persistent sinus may remain, alternately

opening and closing. These cases may give rise to much trouble. In my experience they represent three types:

(*a*) The cyst wall is so immensely thickened that it cannot completely contract. This is analogous to the condition seen in an old chronic cystitis, where the bladder is almost turned into fibrous tissue, and has contracted adhesions to the surrounding parts. Such cases tend to cure in course of time, most of the fibrous tissue being ultimately absorbed and healthy granulations obliterating the cavity. We find it best to lay the cavity entirely open, if necessary resecting several ribs, scrape its walls, and pack from the bottom.

(*b*) There is an abscess cavity containing calcareous plates, which may lie free in the cavity or may line its walls. This will heal up if free drainage is provided and the plates are removed.

(*c*) There is a long, tortuous, branching sinus leading deeply into the liver; it may or may not depend on a lime plate, but there is frequently a deposit of lime on the walls.

These latter cases may be extremely troublesome, and may require several operations. We usually scrape, provide free drainage, straightening the sinus as much as possible, and try to get it to heal from the bottom. In rare cases the wound heals up, but the cavity is not quite obliterated. If at any subsequent time the patient is invaded by septic bacteria, as, for instance, from a whitlow, the old cavity becomes infected, breaks down, and gives rise to a discharging sinus. This should be laid open and packed from the bottom. These persistent sinuses are, however, not common.

Treatment of Ruptured Hydatid.

The abdomen should be thoroughly explored, and probably it is best to wash it out with normal saline solution. In all cases the primary hydatid should be sought for and removed. The outlook is, however, not favourable, as multiple peritoneal hydatid is apt to follow—an extremely dangerous condition. In this connexion, which, however, is so important that it deserves a monograph for itself, it may be mentioned that whenever multiple hydatids are found in the abdomen, the liver should always be thoroughly exposed and examined. Often a primary leaking cyst will be then discovered.

Treatment of Suppurating Hydatid.

This requires no special mention. Operation is generally followed by magical improvement, and the great majority do very well. It is usually necessary to drain for some weeks. Hamilton Russell, of Melbourne, has published a successful case in which, after removing the pus, daughter cysts, and true capsule, he merely filled the cavity with saline solution and sewed it up again.

Finally, mention should be made that Welsh has experimented in the production of, I believe, an antitoxin for the treatment of multiple hydatid of the liver—a fatal and inoperable condition. In these cases the liver is riddled with great numbers of small hydatids; if one is removed the others suppurate, and the patient soon dies. Fortunately it is extremely rare in Australia.

References.
[1] *Australasian Medical Gazette*, August, 1905. [2] Ibid., January, 1910.

SECTION OF TROPICAL MEDICINE.

Fleming M. Sandwith, M.D., F.R.C.P., Gresham Professor of Physic, President.

RUPTURE OF HEPATIC ABSCESSES INTO THE LUNGS.

By James Cantlie, F.R.C.S.,
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Mr. J. Cantlie showed *x*-ray photographs of two cases of liver pus. In one the pus had found its way upwards through the right lung—a frequent method of spontaneous exit; but in another case the *x*-ray photograph showed the pus had pushed up the diaphragm on the left side, and the pus had followed the unusual course of gaining exit by way of a bronchial tube in the left lung. He then said:

At one time exit of pus by way of the lung was regarded as a favourable issue, and one to be waited for when a liver abscess was suspected or diagnosed. The day for expectant treatment of the kind is, and ought to be, a thing of the past, for to allow of a contingency of the kind means either neglect of the physical signs and symptoms of suppurative hepatitis, or an unjustifiable delay in operating. When pus has found exit by way of the lung, unless when it is first actually taking place, it is useless to attempt to reach the abscess by a needle whilst free expectoration is present. I have on several occasions, when hepatic pus was in the very act of being coughed up through the lung for the first time, been able to reach the pus by a needle introduced from the side, and through a trocar and cannula introduced a rubber tube and applied siphonage, thereby relieving the lung symptoms and determining the pus to the tube instead of allowing its further exit by the lung. When, however, the pus has been coughed up for even a few days it is useless trying to reach the abscess cavity in the liver. The walls of the cavity, now relieved of the pus, fall together and it is well-nigh impossible to find the cavity by introducing a needle under such conditions, for the needle point may pass above, below, or beyond the area of the burst abscess. In such conditions it is necessary to wait until the pus reaccumulates. This may never occur, for the pus may continue to be expectorated in gradually lessening amounts whilst the cavity contracts and may finally heal and no further trouble occur. A favourable termination of this nature is but rarely seen.

The usual course is for the pus to find exit by the lung for some time—it may be a few weeks—when suddenly the cough abates, or more often the expectoration ceases; the cough is no longer of a "loose" nature, but dry, hard, and irritable. The temperature goes up two or three degrees, and there are the usual signs of feverishness. What has happened is that the opening of the abscess cavity has become blocked, obstructed, or closed from some local congestion, and the pus is retained. After a few days—two or three—it is usual for the expectoration to again appear, the cough to become loose, and the feverishness to subside, showing that the temporary collection of pus in the cavity of the abscess has found its way upwards once more through the lung. The patient in the interval recovers appetite, gains weight, and is able to go about as he pleases, the pus from the liver causing only an occasional attack of coughing. After the recurrence no more trouble may ensue; the pus gradually lessens, expectoration ceases, and the patient completely recovers.

This may, again, be a delusion, for recurrences of collections of pus may occur again and again with intervals of relief from fever, etc., extending over weeks, or it may be several, even six or more, months. Under such circumstances it is necessary to operate—that is, to reach the pus and drain it off from below, instead of allowing it to drain upwards through the lung.

To attempt to reach the cavity in the intervals between the febrile attacks, when the pus is gaining free exit by way of the lung, will only lead to failure. The walls of the cavity are in contact, and to pass a needle into an area in width perhaps the thickness of a piece of paper is quite hopeless. It is during the febrile attack only that an attempt should be made to reach the cavity by a needle. The communication of the abscess with the lung channel is for the time being shut off; the pus is collecting in the abscess, and when it has attained sufficient dimensions it will overcome the obstacle to exit, and again become expectorated.

The instructions to a patient who has once coughed up hepatic pus should be that the moment the temperature goes up and the pus ceases to be coughed up the doctor should be sent for. Delay may mean that when the doctor arrives the pus is again being coughed up, and another long period of waiting to ascertain if a recurrence of pus collecting in the liver is or is not to take place. The rule is, when the temperature goes up and the patient ceases rather suddenly to expectorate pus—operate.

To find pus that has gained exit by way of the lung is no easy matter, more especially if the channel of exit is of long duration. In the first place, the tract of the pus is deeply situated; as a rule it is close in contact with the pericardium between the inner aspect of the right lung and the right side of the pericardium. In some cases the pus would appear to be conducted upwards between the layers of the ligamentum latum pulmonis, and to gain entrance to a bronchus near the root of the lung; in other

cases the track traverses a wavy course through the inner aspect of the lower lobe of the right lung, and ends in a bronchus near the root of the lung. In any case the path is deeply placed and difficult to reach.

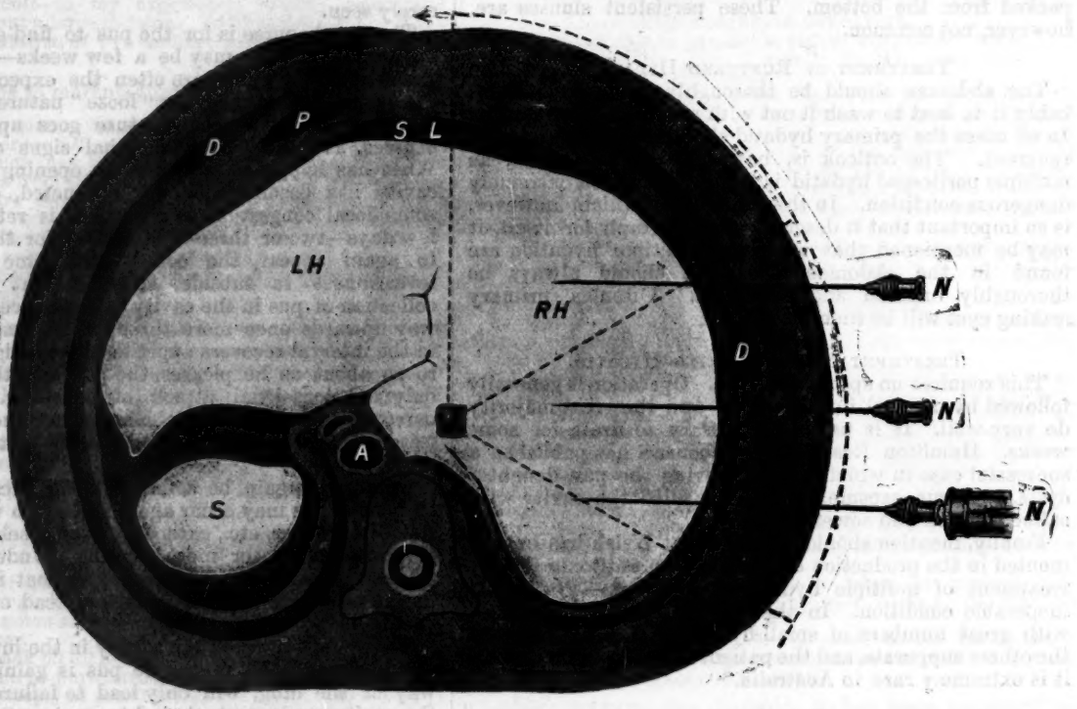
There are three paths by which the abscess track can be reached: (*a*) By opening the abdomen and, after searching for the area of adhesion between the liver and diaphragm, through the centre of which no doubt the pus has escaped, proceed to find the actual channel. This is always difficult, often impossible, and, if found, fraught with the danger of infecting the peritoneum by pus that has been freely in communication with the air for weeks or months. (*b*) By attempting to reach the track by removal of the rib cartilages or ribs themselves in front. This is a proceeding at once dangerous, harassing, and seldom successful. (*c*) By searching for the pus, when a febrile attack is on, and when there is evidence that the abscess cavity has filled, with the hollow needle of an aspirating syringe, and, when it is found, drain the cavity by siphonage. The great difficulty to be encountered is the depth of the cavity and the track from the surface of the chest.

In several cases in my experience the track was so deep that considerable hesitation ensued in proceeding with the operation. If the operation is undertaken at the period when the cavity has refilled, there should be no real anatomical difficulty, but in long-standing cases, when there are no refillings of the cavity and the track of pus through the lung is kept permanently open, when the walls of the track become hard and thickened by fibrous tissue, reaching the track is a difficulty to be seriously considered.

In more than one case of the kind I have had to traverse the chest for a distance of 7 inches from the surface before the track of the pus was struck. No needle of sufficient length being procurable to accomplish the distance, after an incision made in the right side of the chest and a portion of two ribs removed, it was possible to introduce a 5-inch (the longest available) needle sufficiently deep so that the tough wall of the track could be made out, and a puncture made therein recognizable only by the fact that pus was met with. A needle introduced to the depth of 7 inches from the side of the chest must come precariously near the pericardium in even a fair-sized man; yet it is along the side of the pericardium that the track for the pus between the liver and the root of the lung exists, and it is necessary to strike it if a cure is to be made. The only guide there is in such a proceeding is the toughness and rather rugged feel of the wall of the pus channel as the needle reaches and punctures it. Once the track is reached by the needle the introduction of a large trocar and cannula, and the introduction of a large drainage tube stretched on a metal rod through the cannula is a comparatively easy matter.

When the pus from the liver traverses the left lung to gain exit by the air passages the danger of searching for the track by a needle of an aspirating syringe is, as can be readily understood, greatly increased. The natural bulging of the heart to the left, increased undoubtedly by adhesions pulling the heart still further towards the left side, renders searching for pus, deep-seated in the inner aspect of the left lung in juxtaposition to the pericardium, a matter of difficulty and threatened danger. The writer failed to hit the track after three separate attempts, though some half-dozen punctures were made on each occasion.

The only safe method, when transthoracic punctures made from the left side of the chest have failed to reach the track, is to make an incision through the left rectus muscle in the epigastrium, open the peritoneum, pass the finger between the liver and diaphragm, locate the site of the adhesion between the liver and diaphragm, and, holding the forefinger of the left hand against the point of adhesion introduce the needle of an aspirating syringe from a point on the chest wall level with the lower end of the track, and push it onwards and inwards until (with the left finger as a guide) the track is reached. When pus is found a trocar and cannula is inserted, a drainage tube introduced through the cannula in the usual way, and siphonage applied. The last stage of the operation is the closing of the abdominal incision. This procedure is safer than attempting to drain the track through the abdominal cavity to the surface of the abdomen, for pus that is in contact with air in the respiratory passages is highly infective, and therefore calculated to cause a septic peritonitis.



Transverse section of body through the liver. A, Aorta; V, inferior vena cava; S, stomach; D, diaphragm; S L, suspensory ligament of liver; P, pericardium; L H and R H, left and right halves of liver; dotted arc on right side of chest is operable area over liver; dotted radiating lines of equal length showing inferior vena cava to be equidistant from surface of right chest wall; N, N, N, needles consecutively introduced horizontally into liver whilst searching for pus.

Washing out the cavity of a liver abscess which has gained exit by way of the lung is, of course, not to be attempted on any consideration, for the fluid will reach the respiratory passage however gently it is done, and the patient's life is placed thereby in imminent danger. Whilst on the subject of washing out a liver abscess cavity, I may say that I have long ago given up the practice. In the first place, washing out the cavity with a solution of quinine or any other drug does not hasten the recovery. The contention that the

amoebae met with in the abscess wall are killed by the quinine may be true, but that there is danger in the proceeding is well known to any one who has had much experience. The wall of an abscess cavity in the liver, if the disease is progressing, presents no barriers. The broken-down tissue of the liver, with many open-mouthed veins, is the only so-called "sac-wall," and the injection of fluid into the space, should it find its way into the open mouth of a branch of the hepatic vein, will cause symptoms so alarming that should the operator once experience the occurrence he will never again attempt to "hasten" the cure by washing out the cavity of a liver abscess.

The dangers of haemorrhage from puncturing the liver in search of pus is a subject that crops up every now and again. Cases of serious haemorrhage have been recorded from time to time, with the effect of causing doctors to hesitate puncturing the liver when pus is suspected in that organ. That such an accident should deter the search for pus in the liver would be a still greater calamity, as the only positive means of recognizing the presence of pus would be denied us. There is no known single sign or symptom, nor any group of signs and symptoms, by which we can positively diagnose deep-seated pus in the liver; they may lead us to suspect with some certainty the presence of pus, but by the needle alone can the suspicion be actually confirmed. Some condemn the use of the needle for this purpose and favour cutting down upon the liver, and actually, as they say, seeing the seat of the lesion. Exposure of the liver by an incision in the abdomen does not, unfortunately, give much, if any, aid to the recognition of pus in the substance of the liver, nor when it is situated between the layers of the broad ligament of the liver posteriorly.

At the Tropical Medicine Section of the British Medical Association some years ago Colonel Macleod, I.M.S., referred to this point, and mentioned a case in which a well-known surgeon in London, despising the search for pus in the liver by a needle and condemning it as a cowardly and unsurgical procedure, cut down upon the liver, and after a careful inspection and palpation of the liver said there was no abscess in the liver. He sewed up the wound in the abdominal wall, but within forty-eight hours the abscess burst, fortunately into the colon, and the contents of the cavity escaped with the faeces.

When pus is deep-seated in the liver, neither inspection nor palpation will reveal the presence of pus, and if search is made when the liver is exposed there is more danger of haemorrhage from the puncture points than when the punctures are made through the skin and the abdomen is intact, the very contact of the abdominal wall with the liver tending to allay the escape of blood. In an attempt to allay the alarm caused by the reports of haemorrhage following punctures made in the liver by a needle, and believing that severe and sudden haemorrhage is due to the needle wounding the inferior vena cava, I proceeded to examine frozen sections of the body on a level with the liver to ascertain, if possible, how to avoid wounding this vessel. Inspection of many sections of the body showed that the inferior vena cava is situated at an equal distance from the surface anywhere in the operative zone for liver puncture through the chest wall. In a chest of 32 inches circumference (the most common size of the chest in museum specimens examined), the distance of the *centre* of the inferior vena cava from the surface of the chest is $4\frac{1}{2}$ inches at any given point in the operable area. It is, of course, evident that the needle employed in the search should never be introduced to this depth, otherwise the cava will be penetrated. The length of the needle should not exceed $3\frac{3}{4}$ in., and thereby the distance traversed will fall short of the caval wall, and no element of danger need arise from haemorrhage. Another point to be noted is that the needle should be directed horizontally into the liver from the right side; a more thorough search is thereby ensured, and the needle is not directed towards the cava, as in the usual methods of puncture.

DISCUSSION.

Dr. LAWRANCE D. PARSONS (Gibraltar) said Mr. Cantlie's statements concerning the position of the inferior vena cava were not only interesting anatomically, for by the adoption of the rules he laid down for puncturing the liver more confidence would be given to operators to search for liver pus by a hollow needle in any case in which pus in the liver was suspected. He had followed Mr. Cantlie's plan of operating with success.

SANDFLY FEVER (PHLEBOTOMUS FEVER OR "PAPPATACIFIEBER") IN CAIRO.

By LLEWELLYN PHILLIPS, M.A., M.D., F.R.C.P., F.R.C.S.,
Professor of Medicine, Egyptian Government Medical School, and Senior Physician, Kasr-el-Ainy Hospital, Cairo.

FOR the last two or three years I have had to treat many cases of a short fever, accompanied by pains in the trunk and limbs. At first I was accustomed to make a diagnosis of dengue, though they differed from cases of that disease in running a shorter course, in not relapsing, and being unaccompanied by rashes, but I regarded them as being atypical instances of dengue, which had been epidemic in Cairo in the autumn of 1905 and 1906 in a typical form. In the late summer and autumn of 1909 they were particularly numerous, both in the Egyptian Government Hospital and among my private patients. I tried to identify them as Rogers's "seven-day fever," though, as a rule, they were much shorter; one case, however, lasted nine days, but the differential leucocyte count was not convincing. Dr. Wakeling told me that in October, in Mena House at the Pyramids, he had many cases of a short fever to treat, and he himself fell a victim to it; this he put down to infection by sandflies, which were very numerous at that time. (I am uncertain whether he published his observations or not.) During the winter, in one of the medical journals, I read an account of sandfly fever in Malta; the description of the disease fitted the disease as seen by me and described by Dr. Wakeling.

Again this spring I had a further series of cases to treat of a fever, lasting about three days, which was not influenza and certainly not dengue. Some were in hospital; they were either hospital orderlies or policemen (such people would have to report sick immediately on feeling ill).

The private cases were of a similar nature. The details of a few cases are as follows:

CASE I.

L. B. was taken ill on May 20th with pain in the back, headache, diarrhoea, and a dirty tongue. The fever disappeared on the 23rd; on the 24th the tongue was still furred but the pains had gone. There was leucopenia, which made a differential count a tedious operation. There were 61 per cent. polymorphonuclears, 22.5 per cent. large mononuclears and large lymphocytes, 13 per cent. small lymphocytes, and only 1.5 per cent. eosinophiles. Recovery was complete and rapid.

CASE II.

N. B. had slight diarrhoea on May 12th. On the 16th he had a chill and was feverish; he shivered again on the 17th and kept in bed. The symptoms were vomiting, frontal headache, discomfort and soreness of the eyes, pains in the shoulders, and abdominal discomfort. The temperature became normal on the 19th. When I saw him on the 20th his temperature was 99.6° F., with a pulse of 68; he looked ill and drowsy, but there was no rash. His tongue was furred and flabby, and he then was perspiring freely. The temperature finally left him that afternoon, and he recovered quickly. (In the autumn of 1906 he had two attacks of dengue, one in a typical form.) A differential blood count on the 20th showed leucopenia with an abundance of platelets and 64 per cent. of polymorphonuclears, 30 per cent. of large mononuclears and large lymphocytes, 5.3 per cent. small lymphocytes, and 0 6 per cent. eosinophiles. There were no parasites. The duration of the disease was five days; this was preceded by some days' malaise.

CASE III.

A. H., an Egyptian, was taken ill on June 6th with pains in the back and limbs, headache and pain in the eyes; the temperature rose to 102° F. On the 7th it was 99.8° F., with a pulse of 84; his eyes were sore and eyelids puffy, and the tongue was very furred and flabby. Examination of the blood showed leucopenia; there were 66.4 per cent. polymorphonuclears, 30.2 per cent. lymphocytes and large mononuclears, transitional cells 2.2 per cent., and 1.2 per cent. eosinophiles. The temperature that evening became normal, but rose on the 8th and 9th to 99.2° F., and became normal on the 10th (fifth day).

CASE IV.

W. B., was taken ill on May 25th with pains in the loins and back; he felt feverish, and the temperature rose to 102.5° F. that evening. His throat became sore. I saw him the next morning; his temperature was then 102° F., and his pulse 84. He was complaining of general aches and pains, and his tonsils

were inflamed, particularly the left one, which was enlarged. The fever came down that day, and the next day he was well. I made a leucocyte count, and Professor Ferguson kindly checked it. He reported as follows; Slide 1—Polymorphonuclears, 55 per cent.; small and medium-sized lymphocytes, 27.5 per cent.; large mononuclears (hyaline), 10 per cent.; transitional cells, 3.5 per cent.; and polymorphonuclear eosinophiles, 4 per cent. Slide 2—Polymorphonuclears, 60 per cent.; small and medium-sized lymphocytes, 21.43 per cent.; large mononuclears, 14.2 per cent.; transitional cells, 1.5 per cent.; polymorphonuclear eosinophiles, 2.86 per cent. There is a very decided leucopenia; probably the number of leucocytes per cubic millimetre falls between 2,400 and 3,000. This was a short, sharp case. He had last autumn an attack of fever which lasted nine days.

CASE V.

J. R., was taken ill on June 15th with fever, pain in the neck, soreness in the eyes, and some diarrhoea. I saw him about three hours after the onset of the fever. His temperature was 103° F.; his eyes were slightly congested, more especially at the sides of the cornea; his pulse was 120. (He had had endocarditis after an attack of influenza a year ago.) The temperature fell during the day to 99.2° F.; the next morning it was 98° F., and 97.8° F. in the evening. A few days before this he had had an attack of diarrhoea. A blood count on the second day showed polymorphonuclears, 50.75 per cent.; large lymphocytes, 30.75 per cent.; hyaline mononuclears, 4.25 per cent.; small lymphocytes, 11 per cent.; transitional cells, 2.25 per cent.; eosinophiles, 0.5 per cent.; mast cells, 0.5 per cent. There was a decided leucopenia. This also was a short, sharp case. He told me that others in the same house had suffered from a similar illness.

These cases correspond very closely with the description of the disease as described in Doerr's monograph, *Das Pappatacifieber*, published in 1909, and Lieutenant Colonel Birt's "Phlebotomus Fever in Malta and Crete," published in the *Journal of the Royal Army Medical Corps*, March, 1910. I have studied both papers. They are each of them excellent accounts of the disease, with complete experimental proof of the part played by sandflies in the spread of the disease.

Further, Captain Rahilly, R.A.M.C., showed the charts of many cases which had occurred amongst the troops and which had been in the Citadel Hospital.

Sandflies abound in certain parts of Cairo, and Mr. Willcocks, of the Khedivial Agricultural Society, kindly identified and mounted for me sandflies caught on Gezireh. These flies were *Phlebotomus papatasii*.

A short summary of the symptoms of the disease as given by Doerr is as follows: Onset sudden, perhaps with a shiver; disinclination to do anything; pains in the calves, loins, back, and neck, frequently with tenderness of the peroneal nerves, or brachial plexus, or over the intercostal spaces; frontal headache, with tenderness of supraorbital and infraorbital nerves; pain in the eyes, with tenderness of the globes; injection of the conjunctiva, particularly on either side of the cornea; there may be some injection of the soft palate and fauces or some tonsillitis; vomiting frequently occurs; constipation is the rule, though there may be a gastro-intestinal form with diarrhoea; the tongue is usually coated and flabby; bradycardia may occur, or the pulse be infrequent in relation to the temperature; the blood shows leucopenia, with a diminution of the polymorphonuclears and the eosinophile cells, and an increase of the large lymphocytes and large mononuclears; platelets may be abundant; as a rule there are no rashes, though the face and eyelids may look swollen, and an erythema may occur. Relapses occur occasionally. Sandfly bites and lesions produced by scratching may be noted. Defervescence is usually rapid in from three to five days, though abortive attacks may only last a few hours or one day, and may even be afebrile; longer attacks up to seven or eight days may occur, but these may be due to some complications. In contradistinction to influenza, catarrhal symptoms are very rare. The mortality is practically *nil* and the incubation period usually five to seven days.

In contradistinction to dengue, the latter disease in a typical form only occurs in the late summer and autumn, and then generally in well-marked epidemics, whereas this disease occurs throughout the whole of the hot weather from the spring to the autumn. The absence of rashes and the extreme rarity of relapses helps also to differentiate it. The blood picture too is slightly different; whereas in sandfly fever there is a slight diminution in the polymorphonuclears, 50 to 60 per cent., and a great diminution in the eosinophiles, with an increase in the lymphocytes and large mononuclears; in dengue, according to Dr. Balfour, there is a very great diminution in the polymorphonuclears even as low as 27.75 per cent. in one case, with a very great increase in the lymphocytes even up to 53.25 per cent. The eosinophiles were usually diminished.

The blood count enabled me to distinguish a mild case of scarlet fever which rather closely resembled this disease, as the polymorphonuclears were up to 83.75 per cent. and the eosinophiles to 3.75 per cent., nor was there leucopenia.

That there is a third disease present in Cairo which is neither influenza nor dengue is certain. Dr. Sandwith refers to simple continued fever in his book on the medical diseases of Egypt; the shorter forms so described are, in my opinion, this disease. From the foregoing descriptions it seems to be certain that it is identical with Doerr's *Pappatacifieber*. It is said to attack most especially new comers. Many of my cases were, however, oldish residents or Egyptians.

One more disease, probably common to the whole Mediterranean basin, must, therefore, be added to the nosology of Egypt, but luckily a milder disease than the dreaded Mediterranean fever.

DYSENTERY.

By G. H. FINK, Major, I.M.S.(ret.).

THE old observers classified dysentery under the heads (1) acute and (2) chronic, and riveted their attention, in tropical regions especially, on climate and season of year, clothing, water supply, and diet. This disease, through the light of bacteriological investigation, serum tests and therapy, has undergone a great change in the methods of diagnosis and treatment, both local and general, and therapeutic as well as dietetic. There is also a suggestion in such a method as the latter, of the etiology of the disease, its degree and character, as well as the suitable treatment. The disease has been divided into (*a*) catarrhal, which is said to be simple and requires simple remedies, (*b*) the bacillary, which responds to the agglutinative reaction, which is negative in (*a*) and in (*c*) the amoebic. The treatment for the two latter, namely, for (*b*) is by the anti-dysenteric serum, and for (*c*) by local applications (enemata), which are useless in treating the bacillary form.

The factors of old, namely, climate, clothing, water supply and food, in tropical countries cannot be neglected even though we have a clearer differential diagnosis and a more appropriate treatment through the tests applied.

Notwithstanding this, there is in tropical countries an endemic zone or area present where some of the worst types which would come under the term suggested lately as "paradysentery" and also the term "malignant." This zone or area is not quite defined in our maps, but is well known among tropical observers, and circumscribed in their mind's eye.

I venture to affirm that of the worst types some are associated with malaria; and if scurvy be present at the same time the term "malignant" is more applicable to this form of the disease.

Then, again, we shall find that some of the types are associated with malaria of the intermittent and the remittent forms of malarial fever—in water-logged, clayey soils the former, in sandy soils with extremes of temperature by day and by night the latter, to which scurvy (in the latter) is often superadded. Why? Because the country is generally devoid of vegetation to a great extent, and antiscorbutic vegetables are not to be found, nor much fruit, except in certain cases scattered over the valleys. In such a country, as a rule, the water supply is charged with saline matter and foreign particles, and boiling has little effect on them. Physically the water presents every appearance of being good and pure and is clear as crystal. Even the native inhabitants of these regions I refer to are careful in drinking it freely; they wet their tongues simply.

As a rule, in these parts the troops and followers (natives) are usually the sufferers. The disease first breaks out among followers; they are enlisted all over the plains, and without any discipline, and their diet, which is scanty in their villages, is suddenly raised to a higher standard on service; hence the fact of over-eating and over-drinking the water of these regions sets up diarrhoea of a violent form, followed by catarrhal dysentery later,

which lastly terminates in malignant forms when the system has been very greatly lowered. Malaria and scurvy play a further part in draining the blood, hence the condition of the intestines and their glandular system can be well imagined. Nature endeavours, therefore, to relieve herself of the trouble, and eventually the mucous membrane pours out mucus, the arterioles are opened out, and, blood and mucus commingling, a sphacelus is set up which soon terminates fatally if not properly treated.

In the case of the European and some of the agricultural races of native soldiery, monotony of diet plays a part as a factor in the production of this disease in bad forms.

We can readily understand that if the disease breaks out among followers in the form mentioned above the watercourses require guarding, and the foci of bad or defective sanitation—those who know the habits of these people can fully appreciate how difficult it is to enforce rules—attract carriers of infection; hence the disease soon spreads.

Such types of dysentery are not witnessed in those regions with a clayey soil and intermittent malarial fever, although at times among the civil population (perhaps in gaols) it does assume almost as bad a form as I have just described. But some of the worst forms occur without evidence of malarial attacks, and I believe are due to something defective in the dietary. They may or may not start with diarrhoeic trouble first; vegetables and fruit are withheld, catarrhal dysentery is set up, and, with a further restriction of vegetables and fruit, scorbutic taint sets in and the disease turns chronic and of the worst type.

Treatment.

What is the treatment in such cases? Here we are bound to assert that our old masters have taught us much when they riveted their faith in clothing, water supply, and food. If the clothing be suitable (flannel close to the skin and over the abdomen), the water supply good (either properly filtered water or boiled and filtered), and the food nourishing and bland and simple, as well as appropriate to the stage of the disease, then the older medicinal remedies (ipecacuanha, Dover's powder, laudanum, etc.) would benefit, and in the case of modern methods, too, benefit would follow, not otherwise. As to monotony of diet while on service or in standing camp, we all know how monotony of diet operates, for if a person does not enjoy his food full nourishment does not follow. The gustatory nerves are not excited to action, and the gastric juice is either deficient or of poor quality, since the secretions of the human body are the result of proper nourishment if they must be healthy and of good quality and quantity. The other organs besides the stomach react in a similar manner, hence the digestion of food is improper, and decomposition must set in more rapidly, and auto-intoxication must follow in consequence. Some of the native remedies in the early stages of the disease cut it short; but the usual routine treatment in the tropics is, I think, a safe one to start with—namely, castor oil with either peppermint water alone, or a teaspoonful of brandy added if the griping is severe, followed by ipecacuanha in powder, and preceded with a mustard sinapism over the epigastric region to prevent vomiting. Later, Dover's powder in proper doses according to the patient's age, etc. Magnesium sulphate, liquor hydrargyri, bismuth, and soda, with tinctura cannabis indica, etc., have also been valuable. I would mention three drugs which are indigenous and are valuable—namely, aesofgole, tukmâ, and the boel fruit (*Aegle marmelos*). The two former are given in the acute form, and boel fruit in the chronic form.

There was also a very noted powder in use in the chronic form which did good, and I have seen a case of three years' standing (no malarial fever) cured, though the patient was reduced to a shadow. The constituents of this powder were on ready analysis found to be caraway, cummin, and aniseed, parched lightly and ground to a powder, to which was added liquorice powder, which gave it a sweet and pleasant taste, compounded with the rest of the ingredients. Of this powder a tablespoonful was taken three times a day with powdered sugar candy.

Diet.

Nourishing food (chicken broth, milk, or milk and mucilage of tragacanth mixed, but passed first through a fine sieve; jelly) used to be given, and the patient taken on to the more easily-digested meats—first fish, and so on—gradually feeling one's way. No tea or coffee, but only cocoatina, and no starchy substances like cornflour, blancmange, etc., were allowed. Later, if alcohol were required, port wine with jelly was given, and gradually increased.

If monotony of diet plays a part as factor in the case of the disease in the regions mentioned, and water is a powerful cause in creating diarrhoea, I would suggest that, to break the monotony in the case of the European, perhaps he would be better off under such circumstances to take kindly to the native diet twice a week merely as a change. In the case of the agricultural native soldier, if he could be induced to partake of tinned milk and canned vegetables and fruit—provided he was shown how tinned articles were prepared, to remove that prejudice there is—I feel sure that under such trying conditions (as many of our native soldiers see no objection on service) he would also take kindly to the articles. As a rule, the agricultural class have a very much better standard of diet than others (milk, vegetables, and fruit are added to flour, pulse, and clarified butter).

Monotony of diet cannot play any part in the case of followers whose diet is the same at home as on service, only perhaps more liberal at times in the case of some while on service. But I would strongly recommend tea as rations to all, for they will not boil their water before drinking; if tea were the excuse, they would, I feel sure, and it would benefit all arms of the service under such circumstances as the above. Alcohol is not a substitute for coffee and tea, although valuable in many cases medicinally, and also in the case of those who are accustomed to it in the tropics, after sunset.

I do not discuss the subject, for we have lately had the limit of this substance experimentally tested under healthy conditions, to show that there is a limit in health.

In the case of an outbreak of diarrhoea on the march, or the standing camp, the cause can be defined as a rule; but it seems sound to run no dangers to the fighting line, hence segregation from the start is necessary, and a special base for the treatment of the worst cases. Too many cases treated together on the lines of communication or standing camps create a danger for the reasons given above, and the most careful attention to sanitary principles in the matter of latrines and water supplies are often broken through, except at the base, where it can be enforced. This is due to infective causes and the carriers of infection in camp.

Whether *Aegle marmelos* (boel fruit) in the chronic form acts merely as a demulcent and food, or is also antiscorbutic, is a point for further inquiry; its seeds in the ripe fruit are very much surrounded by a sticky gum which is somewhat astringent, and I am of opinion that this element in the ripe fruit is the valuable agent. It is the ripe fruit made into a sherbet that is drunk and is useful in dysentery, and not the raw fruit. Some people, when the ripe fruit cannot be obtained, place the raw fruit over a sharp charcoal fire to ripen or rather soften it, and then use it in the same manner; but it is a poor substitute for the ripe. I see that mangosteen (*Garcinia mangosteen*, nat. order, Guttiferae) has been recommended of late.

THE INCIDENCE OF BILHARZIOSIS IN EGYPT AND ITS CLINICAL MANIFESTATIONS.

By FRANK COLE MADDEN, M.D.Melb., F.R.C.S.Eng.,

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RELIABLE statistics of any disease are notoriously difficult to obtain in Egypt, owing to the ignorance and suspicion of the mass of the people, and their deep-rooted objection to having their names or affairs set down and perpetuated in any paper or book that may form part of the Government archives; and there is a further difficulty with bilharziosis in that both the (Egyptian) medical man and the patient, or his friends, may not think it worth while mentioning the existence of such an ordinary everyday condition as this, in addition to any other disease the patient may wish treated or which may have been the cause of death. It is possible, too, though difficult to

prove—owing to a peculiar reticence on this subject—that, as in certain parts of the Transvaal (Brock), haematuria is looked upon as a sign of manhood and without which the begetting of children is impossible. This belief appears to be prevalent to a considerable extent in Egypt, particularly among young men, and not infrequently leads to a concealment of the fact of infection with bilharzia.

Whether from this reason or from ignorance of its effects, there is no doubt that, among all classes of the people, many cases of bilharziosis go entirely untreated, and so the risk of infection to others is enormously increased. In this connexion I may mention that at the present moment I am attending a pupil of one of the public schools in Cairo with severe bilharziosis of the bladder, and he was frankly amused when I reminded him of his possibilities of infecting others and suggested his taking certain precautions to prevent this happening. He told me that the disease was so common among his fellow students that any isolated attempt on his part to take precautions would not only be quite futile, but would also undoubtedly subject him to the ridicule of his fellow sufferers.

Sometimes, also, the disease may exist in such an early stage as to give rise to no symptoms. Some years ago my former colleague, Mr. Frank Milton, found that of 100 consecutive admissions to hospital, irrespective of their disease, 35 had bilharzia ova in the urine, and only 2 of this number complained of symptoms of bilharziosis;[1] and in a school near Cairo Kautzky found eggs in the urine of 79 per cent. of boys out of 124 examined, although all professed themselves to be in perfect health.[2]

The publication of the annual reports of Kasr-el-Ainy Hospital, by Dr. H. B. Day, the Medical Registrar, gives me the opportunity of arriving at a fairly accurate estimate of the frequency of the disease among in-patients; but these figures do not include the large number of patients with bilharzia ova in their urine, or suffering from painless haematuria. They really only comprise those in whom the symptoms have become so urgent as to compel them to seek hospital treatment, and then only because the increasing gravity of their symptoms entirely prevents them from carrying on their everyday work. The Egyptian fellah—to use an appropriate colloquialism—will go on till he drops; and when he does at last give in his condition is such as to almost absolutely preclude the possibility of any relief being afforded him either by medical or surgical measures. The prognosis in such cases can well be imagined, and only the very mildest operation is required to upset the condition of unstable equilibrium, on which the whole urinary tract has been balancing for so long, and to hasten the fatal issue. Any such intervention, to relieve pain or other distressing symptoms, usually means an opening of the bladder or pelvis of the kidney, after which the introduction of sepsis from without is almost certain to occur, with rapidly fatal consequences.

I have added to Dr. Day's figures a certain fair proportion of patients classified under other heads, such as renal colic, vesical calculi, hydronephrosis, pyonephrosis, etc., conditions we know from experience to be in the main bilharzial in origin or certainly associated with the presence of bilharziosis in the bladder.

I have studied the figures for the three years 1907-9 inclusive, and find that in 1907 the total number of admissions for medical and surgical diseases was 3,400, and of this number 336, and probably more, had bilharziosis; in 1908 the admissions were 4,003, with 465 of bilharziosis; in 1909 the admissions numbered 4,295, of which 469 had bilharziosis; making a total of 11,698 admissions, of which 1,270 had bilharziosis—that is to say, a proportion of 10 per cent.

Males predominated in the proportion of 93.2 per cent. as against 6.8 per cent. females—a fact to which I have drawn attention elsewhere.[1] It is probable, however, that there are more untreated cases among females than males (Elgood[4]).*

These figures do not touch the large number of bilharzia patients treated as out-patients, who are quite impossible to trace, so that the only real conclusion we can draw from them is that in the largest hospital in Egypt 10 per cent. of the total number of admissions for medical and surgical disease are suffering from the last stages of pathological destruction of kidneys, ureters, bladder, urethra, and rectum, produced by severe and repeated bilharzial infections. At least another 30 per cent. are infected in varying degree, but are not absolutely prevented from working or are only temporarily disabled. Looss found that 30·5 per cent. of boys in a Cairo school had haematuria, and 80 per cent. of the boys in the outskirts of the same town.[3] It is probable that a far larger proportion of cases would be found among the agricultural labourers, from which class the majority of our patients are recruited.

The mortality from bilharziosis *per se* or its immediate complications was just over 10 per cent.; but this hardly gives one even an approximate idea of the real mortality, as many cases, when they do not appear to be improving, are taken out of hospital to die at home, the native population here as elsewhere having a strong prejudice against dying in hospital. All such cases are entered as unrelieved, but had they been left in hospital many of them would certainly soon have been included in the mortality tables.

The cause of the severity of the symptoms and the resulting mortality is the repeated reinfection to which the fellaheen are particularly liable. A single infection may be, and often is, entirely recovered from, especially in females (Elgood[4]), but it is difficult to see how such a happy result can be expected in the agricultural labourer, whose very work and habits render him all too liable to a long series of infections. It is not uncommon to find very old bilharzial lesions in bladder and rectum, and at the same time quite young worms in the portal vein, with intermediate stages in the chronological sequence of bilharzial pathological changes scattered throughout various parts of the body.[1]

Post-mortem records afford rather a striking confirmation of the figures just quoted. Dr. A. R. Ferguson, Professor of Pathology in the medical school and pathologist to the hospital, tells me that in a careful record of a series of 500 autopsies on male subjects between 5 and 60 years of age, he found that 8 per cent. of all cases died of the effects of severe bilharzial infection. He cannot give exact figures of the number of cases in which bilharzia worms were found in the portal vein or its nearest tributaries, but they certainly are present in a very large proportion of autopsies of all natures, and that, too, without being necessarily associated with any very obvious bilharzial manifestations. So convinced is he that bilharziosis is really the scourge I would have you believe that, from his experience in the *post-mortem* room, he would venture to affirm that about one-half of the agricultural population of Egypt are shedding their blood and bilharzia ova, in urine and faeces, daily into the fields, a very serious drain on themselves and a constant menace to their neighbours as a source of infection and reinfection.

My contention, then, is that among the Egyptian people generally there exists a widespread endemic disease, responsible for much suffering and a very considerable mortality, among the agricultural population particularly, which we, as the controlling powers of the public health of the country, have done nothing to try and prevent. Good work is being done in the investigation of the life-history and mode of infection of the worm by Professor Looss, and in the demonstration of its pathological effects by Professor Ferguson and others, but no determined effort has ever yet been made to deal with the prevention of its ravages throughout the country. Only those who are conversant with the habits and ways of the people are capable of judging of the apparent hopelessness of the task; but it is surely time that a beginning should be made with it, though along what lines it is not easy to indicate. Unfortunately, though the harvest is ripe and ready for the hand of the reaper, the labourers are few, and there is no money to pay others; so once more, as so often in Egypt in such matters, we must leave the poor fellah to his bilharziosis—a decision he will doubtless accept with his accustomed equanimity and indifference, and his inevitable—in this case almost accusing—"maaleesh!" †

Clinical Manifestations.

To understand the sequence of events in the general distribution of bilharziosis throughout the body one must

* It is true that these hospital patients are, in the main, drawn from the class of the population most liable to infection and repeated reinfection; but in estimating the frequency of the disease in general it is well to note that many patients of the better class are either able to be medically treated outside or are content to look upon their affliction as an inevitable result of their living in Egypt, and take no notice of it at all.

† "Don't worry about it!"

remember the centrifugal distribution of the worms from the portal vein, which may be considered the distributing centre. For a detailed account of this interesting subject I must refer you to Looss's article in Mense's *Handbuch der Tropenkrankheiten*, but the main facts are these:

The worms set out on their travels, heading against the portal circulation, for the most part unattached; but as they reach the mesenteric veins (and get out of reach of home) they choose their partners, and then seem to steer by mutual consent for the veins of the pelvis, where they take up their permanent residence, especially in the submucous tissues of the bladder and rectum. Pathologically these organs are the two main dépôts of sexually mature bilharzia couples, and in and around them the various morbid changes produced in the tissues by the presence of the worms and their ova are most frequently and severely manifested. But these viscera are not true centres from which the disease radiates into surrounding tissues, extension really taking place by the coalescence of individual areas of disease, each produced by a couple of worms or a colony of worms, which have reached their particular focus by way of the veins of the portal system.

The effects are limited by the extent of surface or area over which each couple is able to disseminate its ova. Large areas of disease are due to the combined action of many couples, working side by side, each taking charge of a particular area for destruction.[1]

Fresh supplies of couples with their potentialities of danger and destruction are constantly arriving from head quarters—the portal vein—and may be distributed to any part of the body on the lines of communication of the portal system; or some may even slip over into the systemic circulation, through the numerous anastomotic channels with the portal system, and so bring about the general dissemination of the disease throughout the body.

(*a*) The symptoms of bilharziosis of the genito-urinary tract may be considered separately, though it very frequently happens that they are associated with symptoms of equal or, at any rate, considerable severity in the intestine. The first suspicion of the disease may be an almost insignificant haematuria, and that only in the last few drops of urine. It may be entirely painless, but is very soon associated with a feeling of irritation in the neck of the bladder and an increased effort to empty the viscus of urine. This irritation leads almost naturally to a muscular spasm, which produces an abrasion of the much-softened and infiltrated mucous membrane of the trigone and neck of the bladder and so provokes the haematuria. Gradually the symptoms of "irritability of the bladder" manifest themselves, with a steady increase in frequency and urgency of micturition, and the urine, though still acid in reaction, becomes cloudy and so remains. The subjective symptoms of irritability in the urethra and neck of the bladder steadily increase, the only real pain being just after the voiding of the urine, from the spasmodic muscular contraction of the bladder sphincter. In the earlier stages the severity of the symptoms is often quite disproportionate to the extent of visible pathological change, there being sometimes very little abnormal to be seen in the mucous membrane of the bladder. As the disease progresses—and it generally does so, slowly, to be sure, but with a steady persistence—the disproportion is just contrariwise; indeed, it seems remarkable that the symptoms should be so comparatively mild when so complete a disorganization of the bladder, ureters, and kidneys is proceeding. The condition is now one of chronic cystitis, with blood and ova in the urine as distinguishing features.

It would be tedious to describe the successive stages of the increase in severity of the symptoms and the variations in the character of the urine; but there is a peculiar grey-green urine, characteristic of the advanced stages of the disease, which is worthy of special mention. This urine has entirely lost its normal redness, and is turbid with muco-pus, is of low specific gravity, and very deficient in urea; and one is accustomed to look upon it as an indication that septic involvement of the whole of the urinary tract exists in a very severe degree.

Only too frequently we are not privileged to see the case till he has reached an even later stage than this in his downward path. At this stage

The ever-present symptoms of cystitis and the almost constant micturition, from the irritation within and the small size of the contracted bladder, the scalding in the urethra during the passage of urine, the pain above the pubis, in the perineum and rectum, and tenesmus, all combine to make the patient's life an absolute misery to himself.

The condition may at any time become aggravated by the deposit of phosphates on the abraded mucous membrane or on the ragged tops of papillomata or sessile masses. The whole interior of the bladder may be thickly crusted with these phosphatic masses, which go on increasing as the cystitis persists, and the urine is always alkaline. Pieces of these incrustations may break off and form the nucleus of phosphatic stones, which are a frequent accompaniment of this disease, and are formed in exactly the same way as a stone forms on any other foreign body. A great many stones are, however, met with in bilharzial bladders which consist of uric acid or oxalate of lime, with sometimes alternating layers of phosphates. Such stones would appear to form in the bladder or pelvis of the kidney on a nucleus of bilharzia ova, or more probably on a small piece of papilloma, at a time when the urine is still acid, the layers of phosphates being deposited during a mild attack of cystitis which has subsequently yielded to treatment.

The conditions found on abdominal, rectal, or combined examination and with the sound will vary with the pathological changes within the viscus and its immediate neighbourhood. Many of the grosser lesions, such as tumour masses, sandy patches, concretions, and stones, can be felt with a sound, and the extent and contour of the bladder cavity and the thickness of its wall determined.[1]

In certain cases there may be an almost constant oozing of blood from the shaggy surface of degenerated papillomata, and the urine may be almost entirely blood altered by decomposition. This may clot in large masses in the bladder with acute retention and necessitate a free opening through the perineum for its removal.[1]

The last stage of all presents a truly dreadful picture. The patient is usually a prematurely aged man in the last stages of weakness, emaciation, and exhaustion.

He has constant micturition, really an incontinence and dribbling, with pain in the penis and deep down in the perineum near the rectum. He very often carries his scrotum in his hand, feeling that the support affords him some alleviation of his pain. A very small quantity of water is voided at a time, which is very offensive, dark brown in colour (or grey-green at times), and turbid, and on standing it deposits phosphates, débris, blood corpuscles, and ova. On examining the abdomen, a hard mass may be felt in the suprapubic region, which is not at all tender, is very irregular and stony, and may extend upwards as far as the umbilicus and to any extent laterally. One or both kidneys will be found enlarged and tender, and the much-dilated and thickened ureters may be felt through the unusually thin abdominal wall. The whole course of the urethra may be hardened, or, on the other hand, it may be quite unaffected. On rectal examination the bladder will be felt firm and contracted, and bimanually the great thickening of and around the bladder will be well appreciated. On introducing the sound, it can often only be passed just beyond the neck of the bladder into a very much contracted cavity. Masses of bilharzial tissue may be felt crusted with concretions, but in many cases such is the contraction of the space within the bladder that, beyond feeling that the end of the sound is free in a small cavity, very little else can be made out.[1]

In such cases a perineal opening is made in an attempt to relieve the patient, after which he quietly melts away with a marked increase in his emaciation, and all the usual evidences of a septic urinary tract.

The *post-mortem* appearances of these advanced cases are quite appalling in their severity, with all the results of mechanical obstruction to the outflow of urine superadded to the filthiest septic condition imaginable, extending along the whole length of the urinary tract. There are found destructive and obstructive changes in the bladder, enormously thickened and dilated ureters full of decomposing urine and pus, with hydronephrosis, and more often pyonephrosis, of varying grades of severity; septic dilated pelves, with secondary cystic atrophy of both kidneys, which are full of collections of pus, and imbedded in purulent infiltration of retroperitoneal tissues, extending even down into the pelvic cavity. Enormous fibrous thickenings of the bladder wall and its surroundings, and hard cancerous masses in the same situations, these often with secondary cancerous deposits in the heart muscles (Ferguson), constantly occur; but, though they are interesting pathologically, they do not, or cannot, increase the distressing symptoms to any great extent. The hopelessness of treatment of any kind in such conditions is only too evident; the mystery is how the poor unfortunate patient could have lived so long.

In a considerable number of cases, either in addition to the bladder symptoms or entirely apart from them—though in all cases there is some infection of the bladder or other part of the urinary tract—there are signs of involvement of the urethra in the general bilharzial dissemination. Attention is first drawn to this in most cases

by the presence of urinary fistulae, but the usual pathological manifestations common to mucous membranes may, and must have, existed for some time in the urethra before there is any outward and visible sign of their presence.

A very early case will present a somewhat tender lump in the perineum, corresponding with an ulcerated surface or pouch in the mucous membrane of the urethra, with a hard fibrous induration around and beneath it. The edges of this crater in the urethra are rough and may be coated with phosphates and give rise to a grating on the introduction of a sound, but there is no obstruction. The lump gradually increases in size and softens to form an abscess which bursts externally and forms a fistula, usually only the forerunner of many others which originate from the urethra in a peculiarly restricted area, from the anterior layer of the triangular ligament to the posterior margin of the scrotum, in a large majority of cases. These fistulae comparatively rarely come from the floor of the urethra and involve the corpus spongiosum to open in the middle line of the perineum. They generally start from the urethra either laterally or even from the roof and then track round between the corpus cavernosus and the corpus spongiosum and open to one side of the middle of the perineum; or not infrequently by more extensive burrowing at more distant orifices anywhere round the anus, out on to the buttocks or scrotum, or even on the front of the pubis or groins.

Obstruction is quite the exception, but must occur when there is much destruction of portions of the urethra and also in floor fistulae.

The severest cases of multiple fistulae give rise to a false elephantiasis of the scrotum and perineum which is very characteristic. The anterior portion of the urethra does not entirely escape and its involvement is associated with a series of changes which are best described as bilharziosis of the penis.[5] Pathologically these appearances are all due to obstruction of lymphatics, by destruction of or pressure on existing lymphatics by the peculiarly dense bilharzial fibrous tissue, which develops around the infected urethra or around its many tortuous fistulae. When the first inch or two of the urethra is involved, the hard oedema remains localized to the glans penis and the prepuce, giving rise to a bulbous appearance, the end of the organ being sharply separated from the rest of the body of the penis by a deep furrow at the junction of the healthy skin. From the much scarred and contracted meatus pus is sometimes discharging, indeed this condition is sometimes taken for gonorrhoea, with concomitant balanitis and inflammation of the prepuce.[6]

If more of the organ is involved, the swelling usually extends as far back as the root of the penis, which is sharply separated from the skin over the pubis by another deep furrow. In these cases there may be evidence of the involvement of the lymphatics of the scrotum, or these may escape entirely. Running through the swollen tissue fistulous tracks may be traced, communicating at various points with the penile urethra. When these tracks are multiple the structure of the body of the penis may be largely destroyed, and masses of swollen tissue appear, intersected in various directions by fistulous tracks or by bands of scar tissue where fistulae originally existed. Sometimes, especially in young boys, the swelling of the skin may be present without any sign of fistulae, though ova are found in the urine and there is infection of the urethra to a mild extent.

In all these conditions much can be done by decortication of the whole body of the penis from just behind the glans to the pubes and subsequent grafting, while in a non-septic case lymphangioplasty has been practised.

Localized nodules may be met with in the subcutaneous and erectile tissues of the penis; and ulcerations, which may end in epithelioma, are by no means uncommon on the glans.

Again, the last stage of all in this series of lesions is a truly awful condition. There is a permanent distorted erection of the penis from the extensive irregular infiltration of the erectile tissue with bilharzial induration. The whole length of the urethra runs a tortuous course in the midst of a fibrous mass of stony hardness, which is pierced with many fistulae, and from the meatus a thick purulent and sanious discharge is issuing. The false elephantiasis is not particularly marked, the disease appearing to vent itself on the erectile tissue along the track of the urethra. Micturition is very difficult indeed, and must be agony, to judge by European standards, especially as superadded to these essentially urethral symptoms are all the dreadful bladder troubles already enumerated.

Obviously nothing can be done, but mercifully the end is not far distant.

(*b*) Bilharziosis of the intestinal tract in most cases gives rise to the presence of bilharzia ova in the faeces, but, clinically, its symptoms are those of dyspepsia, enteritis and colitis.

Though bilharzial cysts in the mucous membrane of the stomach[12] and ova in its muscular walls (Goebel) have been reported, the most common seat of infection is the lower part of the small intestine and the large intestine generally.

The most common lesion in the intestinal tract is the presence of papillomata of varying sizes and characters along the whole length of the intestine from the ileum to the anus, sometimes thickly scattered or again sparsely distributed throughout the mucous membrane. Beyond some general irritation and a tendency to diarrhoea, with the passage of blood-stained mucus from time to time, this condition gives rise to wonderfully few symptoms, and symptomatic treatment is all that is possible. Sometimes, however, the symptoms come to resemble dysentery very closely, with frequent motions, the passage of blood and mucus, with colicky pains and tenesmus. The similarity of symptoms corresponds with a similarity of pathological appearances, for over quite extensive areas of certain parts of the large intestine the papillomata have necrosed and separated off at their pedicles, resulting in ulcers of dysenteric appearance. It is an open question if these ulcers ever heal.

Sometimes, again, certain lengths of the large intestine become infiltrated, together with their peritoneal attachments, with hard bilharzial tissue. There is an enormous thickening of the walls of the gut, a dense packing of its interior with papillomata, and deposits of bilharzia tissue in the appendices epiploicae, and on the serous surface of the gut, and a fixing of the intestine with massive deposits behind it and between the layers of its peritoneal attachments. The line of demarcation between the healthy and diseased gut is usually very distinct.[7] The symptoms are those of dysentery, as a rule, with a hard, painless tumour in the line of the gut in the different regions of the large intestine. There are never any signs of intestinal obstruction, and in most cases the symptoms improve and the tumour disappears after a laparotomy and an exploratory enterotomy, with immediate suture of the incision, in the gut. In the rectum large masses of papillomata may develop and protrude, either permanently or during defaecation, from the anus. The sphincter is at first well contracted, but later becomes patulous and allows the freer exit of pedunculated growths or rings of swollen and infiltrated mucous membrane with all stages of prolapse.[8] At other times the only lesions are ulcerations with scattered papillomata, or a number of fistulous tracks, extending into the ischio-rectal fossa, the perineum, or the buttocks. Ulceration may occur at the anal margin, and is dangerous owing to the possibility of epithelioma developing upon it—a very real danger indeed.

Finally, two unusual anal conditions have been noted recently. The one a large irregular mass of fibrous tissue, encircling the anus and tunnelled throughout by skin-lined depressions, filled with sebaceous material in various stages of decomposition. The surface of the mass was hard, the anus patulous, and the rectum free of bilharzial papillomata or ulceration. The only possible treatment was removal of the lower portion of the rectum, including the anus, which was inseparably involved in the mass. Complete return of control occurred some weeks after the operation. The other condition looks like a crop of papillomata sown all round the anus, perineum, and scrotum, without any fistulae or marked urethral infection. The appearance resembled that of a very profuse venereal warty condition.[9]

(*c*) A somewhat similar papillomatous condition is sometimes found around the external female genitals,[10] though here, as is usually the case, there is more tendency to a localization of the growths. Such papillomata have been described on the labia, in the vagina,[11] and on the cervix

uteri; while softening and infiltration of the mucous membrane may occur in the vagina and around the meatus and clitoris. Ulcerations may also be present at the vaginal outlet, and these may become epitheliomatous. Though, so far as I am aware, no definite lesions have been described in the uterus, deposits of ova with fibrous thickenings do occur in the broad ligaments and in the ovaries.

(*d*) Deposits of ova appear to occur also in the skin and subcutaneous tissues,[1] rather like tubercle, giving rise to shallow ulcerations or sinuses, which may eventually communicate with the urethra or rectum, and produce fistulae. Such ulcerations, particularly on the glans penis, may end in epithelioma.

Such is my indictment of bilharziosis, and I trust I have succeeded in convincing you that there is ample justification for my contention that it is high time an attempt should be made to rid ourselves and our disintegrating patients of this, perhaps the most dreadful, as it is one of the most ancient, of the remaining plagues of Egypt.*

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TYPHOID AND PARATYPHOID FEVER IN EGYPT.

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There are many lacunae in our knowledge of typhoid fever among the native inhabitants of hot countries, and most discordant views are held on the subject. Thus, in India, Roberts thinks the native possesses natural immunity, partly due to anatomical differences in the intestines, partly due also to a different dietary and different habits influencing the toxic and putrefactive processes in the intestine, and partly due to the fact that the native suffers much from dysentery and diarrhoea and thereby gains immunity to the typhoid bacillus. Rogers disagrees with him, finding typhoid fever widely spread amongst Indians.

Sandwith, in his book *The Medical Diseases of Egypt*, expresses his opinion that the disease is comparatively rare in Egyptians, but that now the town dweller is getting more susceptible to the disease. In the preface he mentions it with Malta fever as being a sporadic disease. He thinks the theory erroneous that the Egyptian suffers from it in childhood and gains thereby immunity, basing his views on the *post-mortem* results of Kasr-el-Ainy Hospital. I am afraid I entirely disagree with him, as I will show later. The statistics of the Public Health Department do not give a true picture, as many cases undoubtedly escape notification, and in the provinces proper diagnosis.

Taking these various views into consideration, it is obvious that our knowledge is deficient, and if the real facts about the disease in different tropical countries could be laid bare an advance towards its more efficient control and prevention could be made. The actual state of affairs in Egypt I will try to lay before you.

During the last seven years I have treated, both at Kasr-el-Ainy Hospital and in private, many Egyptians with typhoid fever, and in addition I have seen many other cases in consultation. All grades of society are attacked, fellaheen, servants, policemen, students, and people of no occupation. The disease, though usually mild, has sometimes been severe; I have seen haemorrhage, perforations, and one or more relapses in the same patient. Spots are rare, and constipation is the rule; chest complications, which in my experience are rare in European residents in Egypt, are much commoner in the hospital cases, due probably to improper care before admission and less skilled nursing in hospital (the nursing being done by male orderlies or by pupil nurses). Defervescence seems to be rather rapid and convalescence quick.

The diagnosis has been amply confirmed by the Widal reaction and by *post-mortem* findings. At the Fever Hospital, Cairo, the Widal reaction is repeatedly tried until a positive result is obtained; thus, in 1909, a positive result was noted in 53 out of 54 cases. In Kasr-el-Ainy Hospital the diagnosis is most carefully considered, and the heading "typhoid fever" only put to the case after mature consideration. Owing to stress of work and lack of sufficient assistance in the pathological department, the Widal reaction cannot always be investigated, or often repeated if found negative. It is the practice, when sufficient blood is available, to test the blood against typhoid, paratyphoid B, and Malta fever. In 1910, owing to an epidemic of relapsing fever, it was generally examined also for spirilla. The following are the figures:

Fever Hospital, Cairo.

1908.—Fourteen cases, with 2 deaths. A positive blood reaction was obtained in 12 cases. One negative reaction was seen in a case otherwise typically typhoid. The 2 deaths were from heart failure, 1 within two days of admission before the blood was tested. Two cases relapsed once and 1 twice; there was 1 with haemorrhage. One of the cases that recovered was a Soudanese, the rest were Egyptians.

1909.—Fifty-four cases, with 5 deaths; the Widal reaction was positive in 53. In the other case the patient died before it was attempted. Many of the cases came from the lunatic asylum. On further investigation some of the kitchen attendants gave a positive Widal reaction; they were isolated and no more cases occurred in the asylum, so presumably they were carrier cases. Three Soudanese recovered, the rest were Egyptians.

1910, January to June 30th.—Nineteen cases, with 1 death from heart failure; 18 had a positive reaction and 1 negative, but he had rose spots and a typical temperature chart. One relapsed and 1 had haemorrhage.

Total, 87 cases, with 8 deaths, or 9.2 per cent. Widal reaction positive in 83 cases. The details of 1909 are meagre; of the 33 cases in 1908 and 1910, 4 relapsed and 2 had haemorrhage, or 12.12 per cent. and 6.6 per cent. respectively.

Kasr-el-Ainy Hospital.

1907.—Twelve cases, no deaths; 1 was taken out "relieved," and 1 before the temperature was quite normal. The other 10 recovered. In 6 the reaction was positive, in the others the disease was clinically typhoid with enlarged spleens and diarrhoea, and 1 relapsed. A child of 3 had a strongly positive reaction and bronchopneumonia as a complication. One of the patients was a Berber.

1908.—Sixteen cases, with 1 death from perforation. The Widal reaction was positive in 6, negative in 1, and not done in the rest. One case was discharged before complete recovery, 9 cases at least had chest complications. Two cases relapsed (1 being an intercurrent relapse).

1909.—Seventeen cases, with 1 death. He was admitted dying with a temperature of 42° C. (107.6° F.). One went out before complete recovery.

1910, January to June 30th.—Four cases with 1 death (a Berberine servant with perforation). One of the patients on admission resembled meningitis, but the subsequent course was that of typhoid fever. One other case gave a positive Widal reaction, and 1 negative.

Total, 45 cases, with 3 deaths, or 6.6 per cent. The 4 cases discharged before complete recovery are not included; relapses 5, or 11 per cent., haemorrhages none.

Private cases (Egyptians) 5, all recovered. In 1 there was a long relapse. The case was clinically typhoid, though the reaction showed paratyphoid B. Two of the others were children and 2 boys of about 16, 1 with high fever and 1 with haemorrhage. (Both occurred during the hot weather.)

Totals.	Number of Cases.	Recoveries.	Deaths.
Fever Hospital	87	79	8
Kasr-el-Ainy...	45	42	3
Private cases	5	5	0
	137	126	11

Percentage of deaths, 8.02.

Complications.	Number of Cases.	Relapses.	Haemorrhage.
Fever Hospital	33	4	2
Kasr-el-Ainy...	45	5	0
Private cases	5	1	1
	83	10	3

Percentage of relapses, 12; of haemorrhages, 3 3.

* The assumption of the antiquity of bilharziosis is justified by Dr. Ruffer's recent paper on the discovery of ova in ancient Egyptian mummies (British Medical Journal, January 1st, 1910).

Typhoid fever with 8.02 per cent. of deaths, with 12 per cent. of relapses, and with 3 5 per cent. of haemorrhages, must be regarded as a mild disease. I hold that this mildness is chiefly due to attacks in infancy or childhood, for the following reasons:

1. I have seen many Egyptian children ill with the disease, and in whom a positive Widal reaction was found. Thus, in 1907, there were admitted into Kasr-el-Ainy Hospital, with typhoid fever, five children aged 3, 3, 4, 12, and 13 years respectively; in four the reaction was positive, in one of which it was described as being very strong; in the fifth case it was not tried. At the time of writing I am seeing in consultation the two sons of an Egyptian doctor, aged 7 and 10, with a typical attack of typhoid fever, though mild, in whom the reaction is positive.

2. Some three years ago I had a number of agglutination tests done on the blood of out-patient children suffering from fever with diarrhoea, a few of them were positive. I have been unable since to complete the research. It was impossible to induce these children to enter hospital, as Egyptian mothers have the greatest objection to allowing their children to enter hospital, otherwise we should have had still more cases in the wards.

In the summer of 1909 there was an enormous infantile mortality from intestinal complaints, at one time in Cairo the deaths exceeded the births; it will be seen that last year there were 71 cases of enteric admitted to the Fever Hospital and Kasr-el-Ainy, a larger number than the preceding years. May not some of this mortality have been due to enteric?

At present among the more affluent Egyptians the disease is frequently seen, and young lads are often the victims. May not this be due to increased care in infancy changing its incidence?

Further, if typhoid fever be a new disease introduced by foreigners, since the typhoid bacillus will flourish luxuriously in hot climates (it being one of the principal menaces to health to strangers), it would probably become rampant, as other infectious diseases have done when introduced into virgin soils. The sanitary conditions in the villages and towns of Egypt leaving very much to be desired, every inducement is offered to its spread. It is different with scarlet fever, which in no hot country flourishes even among Europeans (I have only seen one case in an Egyptian in a typical form). I hold, however, that typhoid fever is common in Egyptians, but occurs in a mild form as a rule, this mildness being due to individual immunity acquired from an attack early in life and due partly to hereditary immunity through ancestral attacks. A similar parallel can be drawn with malarial diseases, the adult native being relatively immune, but the children and the foreigner suffering.

The change of incidence of a disease is well illustrated by small-pox, which formerly was a disease of childhod, but which has now changed its incidence—and, amongst unvaccinated adults, its severity. It may be that in England also typhoid fever, with the great modern improvement in sanitary matters, has also changed its incidence, now being chiefly a disease of adolescents or adults. (This might account for the comparatively late differentiation from typhus fever.) Among European children in Egypt, even though brought up with the greatest care, it is common; I have even seen cases in infants under 1 year old.

For comparison with the above I give a short summary of my experience of typhoid fever in Europeans treated by me in my private practice or in the practice of the Anglo-American Hospital. Only those are included in which I was responsible for all or most of the treatment; the many cases merely seen in consultation are not included.

I have so treated 50 Europeans, with 7 deaths. Of these 50 cases, 31 were mild—a larger proportion than Dr. Sandwith experienced. In 3 there was a relapse; 1 with a strong Widal reaction had a previous attack in Vienna three years before; in 1 case the duration was with certainty only thirteen days; she was about three months pregnant but did not abort, nor did another patient who had a mild but long attack. Another case, lasting only sixteen days, was positive to paratyphoid B. In one case, lasting twenty-three days, jaundice appeared on the thirty-ninth day; this seems to be a very rare complication of convalescence; Murchison only recorded very few cases of it. After convalescence she went home to Denmark, so I had no means of finding out if she became a carrier.

One case, though clinically typhoid, gave no agglutinations; from the stools a bacillus was isolated in almost pure culture, which was neither the typhoid bacillus nor the colon bacillus, and he had not been taking lactic acid bacilli; it was not agglutinated by his serum. For such a condition the term "pseudo-typhoid fever" seems appropriate.

The other 19 cases were severe, and 7 died.

1. A man admitted to hospital about the twelfth day of the disease during the hot weather had haemorrhage the same night; this was repeated, and he died on the fifteenth day.
2. A missionary who worked during the first week of his fever in the provinces in the hot weather died in the third week of toxaemia.
3. A male admitted to hospital in August on the eighth day with high fever had haemorrhage on the sixteenth day, and perforation on the twenty-first day.
4. A female struggled about for seven days before giving in; was, when first seen, very ill. At first her blood agglutinated paratyphoid B strongly, and the typhoid bacillus weakly; she had haemorrhage, followed by perforation. This time the blood was strongly positive for typhoid, and gave only a weak agglutination for paratyphoid fever bacillus. A case of double infection.
5. A male continued at his work for a week, in spite of feeling very ill. When admitted to hospital he was very ill, and had diarrhoea. The temperature rose to 105.2°, and on the fifteenth day he developed purpuric spots and some bleeding from the rectum. The Widal reaction was negative. He died on the seventeenth day from toxaemia. Another from the same house had a typical attack of typhoid with a positive reaction. So this was probably also typhoid fever. This case also occurred during the summer.
6. A young girl late in the autumn had fever, which was thought to be dengue; she got up and had haemorrhage, after that the disease took on a toxaemic form, with high fever, and a fatal result ensued.
7. A female developed an intercurrent relapse, and died of heart failure.

Thus 5 of the fatal cases were ambulatory patients; 6 of them were during the hot weather. Four others had a single relapse, 1 two relapses, the second being very severe; the blood reactions were throughout negative. One had two relapses, due to a mixed infection of typhoid and Malta fevers. (Dr. Dreyer has also published a case of double infection of Malta fever and typhoid in an Egyptian.)

I have had 2 cases of severe hyperpyrexia; both occurred during the summer. In one, a girl of 17, the temperature rose to over 105° on sixteen days, and over 106° on three days, in spite of cold baths. The total duration was seven weeks; complete recovery ensued. The other case was that of a nurse; the temperature was extremely refractory in spite of iced baths, and delusions developed which lasted into convalescence. The duration was thirty-seven days. Two summers ago I left a patient to the care of one of my colleagues; she developed after I left hyperpyrexia (over 107°), but she recovered. (This case is not included in my series.) These three very severe cases with hyperpyrexia all occurred during the summer, possibly due to the excessive heat.

Delusions persisting into convalescence occurred in one other severe case; the patient, a Scotsman, thought himself to be a Russian, and actually wrote a letter to his banker on the subject of his proper signature.

As in the Egyptian cases, rashes are infrequent and constipation the general rule, chest complications or abnormal signs in the lungs are rare (possibly in consequence of the dryness of the climate, the better station of life of the average European patient, and the excellent nursing). Two patients only developed thrombosis; both were women with varicose veins. Mortality, 14 per cent.; relapses, 20 per cent.; haemorrhage, 8 per cent.

Long residence does not cause immunity. One of my patients had lived thirty-three years in Egypt.

Dr. Sandwith had a mortality of 7.7 per cent., but his cases included some Egyptians, and mine included several very severe ambulatory cases. Most of the severe cases occurred during the hot weather, the patients being below par through overwork, the heat, and need of leave.

The disease seldom occurs in epidemic form, though small milk epidemics have been noted or a water cistern become infected. Probably green salad and strawberries are to blame for isolated cases and fly infection for others.

Conclusions.

Typhoid fever is common among Egyptians, though generally mild. This mildness is due largely to immunity acquired by attacks in childhood and to hereditary immunity of a partial nature. The clinical course is

not otherwise remarkable, though complications are not frequent.

My thanks are due to the Director-General of the Public Health Department, Mr. Graham, and to Dr. Bitter for kind permission to use the records of the Fever Hospital; and to Dr. Day, late Registrar of Kasr-el-Ainy Hospital, and Dr. Sabongy, resident at the Fever Hospital, for their help.

HUMAN BOTRYOMYCOSIS.

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WITHIN the past year opportunities occurred of studying a peculiar pathological condition in certain tumours which had been sent to the Wellcome Tropical Research Laboratories from various parts of the Sudan. The first of these was a tumour removed from the scalp of a native. Stained sections made from this specimen showed the presence of agglomerations or collections of circular disc-like masses lying irregularly throughout the tumour mass. When stained by the aniline dyes they exhibited a homogeneous appearance without any apparent intrinsic structure and closely resembled collections of staphylococci of varying sizes. They had been previously observed by Dr. Balfour in a growth removed from a camel.

After reference to all the available literature had been made the conclusion arrived at was that these collections of coccal-like masses represented a pathological entity met with in a somewhat rare disease named botryomycosis, and in fact were pathognomonic of it; the disease itself deriving the name of botryomycosis from the resemblance that these collections of coccal masses bear to a cluster of grapes. Since this first case no less than seven other tumours, removed from the breast, arm, hand, foot and scrotum, have been found to contain similar coccal-like agglomerations. Three of these tumours had, in addition, all the pathological macroscopical appearances associated with *Streptothrix madurae* and its presence was subsequently confirmed microscopically. In the others there was no evidence of a streptothrix existing although a careful search was made through a large number of sections taken from various parts of the growths.

It may be stated that one was somewhat diffident in naming the condition botryomycosis but for the fact that the pathology of these growths closely simulated the description given of this disease by Ernst[1] and other observers, who found these collections of coccal-like masses present in certain lesions in animals, notably the horse, cow and hog, and who, for some time, described them as staphylococcal in character. This staphylococcal view, however, is no longer tenable, for special staining reactions have shown them to be of a different nature. Cultural and inoculation experiments would doubtless assist in clearing up the exact nature of these bodies, but, unfortunately, opportunities of examining fresh pathological material have not occurred, resulting in the work embodied in this paper being somewhat incomplete. Kitt,[2] in his textbook on comparative pathology, defines botryomycosis as a productive inflammation leading to the formation of fibrous growths attended invariably with suppuration and fistula formation, or the production of yellowish-red foci of softening caused by infection with the *Botryomyces ascoformans*.

As already mentioned, its pathological effects in animals have been studied by a few Continental observers. The horse, cow, and hog appear to be more susceptible to the disease than other animals. More recently its occurrence in man has also been noted by Bureau[3] and Labbé.

The Clinical Signs of the Disease.

Males seem to be more commonly affected than females. One case occurred in a native woman aged about 45, who had suffered from a swelling in her breast since childhood. For the past two years, however, the condition had occasioned her annoyance, and on presenting herself for treatment the breast was found to be considerably inflamed, exhibiting sinuses which exuded a greyish-white pus. The whole of the breast tissue was involved, the growth simulating a fungating carcinoma, but the lymphatic glands in the axilla and neck were not enlarged. The breast was excised by Dr. Hodson, of the Sudan Medical Department, who kindly sent the specimen.

From the histories obtained in the other cases the disease appears to be more or less of a chronic one, commencing, as a rule, in the form of a superficial nodule, which increases in size, and invades the deeper tissues, eventually involving fascia, muscle, tendon, and sometimes bone. Specimens illustrating this are seen in the appended photographs* of the disease affecting the hand and foot, where the resemblance to mycetoma is a somewhat striking one.

The tumour of the scalp kindly sent by Captain Thomson, R.A.M.C., involved the left occipito-temporo-parietal region. The history of this case is of interest.

The growth commenced about twelve months previously as a small lump about the size of a date, and remained unchanged in dimensions till the patient was advised to have a red-hot iron passed into the tumour to kill it. This drastic treatment was carried out, with the result seen in the photograph*—namely, a marked increase in size. The tumour was movable, but appeared to be adherent in parts to the subjacent bone. When the growth was excised the subjacent bone was found to be soft and slightly infiltrated. The sinuses on the surface exuded a thin watery pus containing yellow-white granules.

The surface of this tumour was covered with sinuses, around which were heaped up masses of white fibrous tissue. This proliferating fibrous tissue was also present around the openings of the sinuses in all the other specimens. The sinuses extended to varying depths, and were lined by granulation and necrosed tissue. In the hand and foot specimens they extended down to tendon and bone, leading to considerable contracture and deformity. If a section be made through one of these growths, its fibrotic nature will be at once apparent, the intervening tissue between the sinuses consisting for the most part of white fibrous tissue. This is frequently arranged in whorls sharply demarcating yellow hyaline-looking areas, which microscopically are seen to be composed of groups of fat cells. Further, lying in this fibrous tissue, masses of yellow-brown pigment are visible to the naked eye.

The microscopical pathological changes are very constant, and consist of:

1. Marked proliferation of fibrous tissues which in certain parts of the section appear to be undergoing myxomatous degeneration, more especially in the areas surrounding the sinuses. Lying in this fibrous tissue are reticulated areas, which contain fat globules.
2. Round cell proliferation of a lymphoid type, suggesting the appearance of a tubercle nodule. Giant cells are occasionally met with.
3. Changes in the blood vessels, there being a periarteritis and a proliferation of the tunica intima and tunica media.
4. Presence of pigment scattered irregularly throughout the tissue in the form of yellow-brown granules lying free and also phagocyted. Special staining methods showed this to be an iron-containing pigment.
5. The presence of large cells of an epithelioid type lying in necrosed tissue and infiltrating the surrounding fibrous tissue. These epithelioid cells are, for the most part, oval in shape, and contain a nucleus and nucleolus, and some show vacuoles in their cytoplasm. They measure 0.3 μ to 12.3 μ, and appear to have considerable phagocytic properties, for many of them contain ingested pigment.
6. Groups of botryomyces lying irregularly scattered throughout the section. These, as already stated, resemble large staphylococci, and occur sometimes singly or more frequently in clumps of coccal masses, three to twelve in number. They vary in size from 0.8 μ to 12.8 μ. On focussing one of these clumps one finds that all the coccal masses do not focus in the same plane, some appearing more superficial than others.

By the ordinary staining methods these coccal-like masses show no differentiated structure. They retain Gram's stain. Owing to their structureless appearance and the fact that their presence in various parts of the section was not associated with any surrounding inflammatory changes, the possibility of their being amyloid or glycogenic in nature indicated that special staining reactions should be employed. The results of these, however, threw no light on their chemical composition, for they gave neither the amyloid nor the glycogenic reaction.

All were acid-fast, and by using special stains a zoogloea-like mass could be seen holding together, as it were, these coccal-like bodies.

Several sections had been examined before any idea was obtained as to the probable method of origin of these coccal masses.

When Muir's method of capsule staining is employed they

* These photographs proved unsuitable for reproduction.

take up the fuchsin stain, the methylene blue staining what is evidently a thin rim of protoplasm around each coccus. Parts of the section, however, when stained by Muir's method, also show two, three, and four coccal discs lying in different focal planes, and clumped together within what appears to be a cell envelope, the whole representing what one may assume to be the botryomycogenous cell described by the French observers. These botryomyces, when intracellular, appear to multiply within the cell envelope till the latter eventually ruptures, allowing escape of the individual cocci, which in turn appear to be taken up by the blood and lymph stream and carried to various parts of the tissues. Sections made from the growth in the scrotum showed these individual coccal masses occupying the lumen of blood vessels. This method of transmission by means of blood and lymph vessels possibly explains the presence of some of these botryomyces in apparently healthy fibrous tissue, their presence there, as already stated, not being associated with any inflammatory changes. While, however, these botryomyces are intracellular, they apparently bring about degenerative changes in the surrounding tissue which is more or less necrosed. After the cell envelope has ruptured, these coccal masses evidently undergo some form of degeneration of a hyaline type and assume different staining reactions, for in sections stained by haematein and eosin the intracellular coccal masses take up the nuclear stain of the haematein, while the escaped extracellular ones show an affinity for eosin and appear more hyaline in consistence. Even when enclosed within the cell and prior to rupture of the cell envelope these coccal masses sometimes undergo degenerative changes, taking on almost a neutral staining tint, showing neither a distinct affinity for the haematein nor for the eosin.

Similar staining reactions were obtained with Leishman's stain, the coccal masses taking up the nuclear stain when occuping a position within the cell envelope, and showing an affinity for the eosin when extracellular, appearing at the same time more hyaline looking and structureless in contrast to the granular and often vacuolated appearance exhibited when occupying their intracellular position. Sections stained with iron haematoxylin alum and counterstained with saffranin show very well the central nuclear structure of these individual botryomyces surrounded by a saffranin staining rim of cytoplasm, which, in some cases, appears striated.

Further work requires to be done to establish the exact nature of these botryomyces, and their possible mode of transmission to man. As already stated, considerable assistance would be obtained if one had access to fresh pathological material, but so far opportunities for this have been lacking. In animals the disease is transmitted by direct infection through a wound or abrasion of the skin, especially in those parts of the skin subjected to friction. Man, in all probability, becomes infected in a similar manner, but the possible rôle played by ticks and other biting insects would have to be considered.

CONCLUSIONS.

From the fact that a streptothrix condition was present in three of the tumours sent for examination, one is inclined to come to the conclusion that botryomycosis is really a streptothricosis, and that the clumps of botryomyces in reality represent the gonidia of possibly a new and hitherto undescribed species of streptothrix.

Reference has been made to all the literature available here, including Brumpt's[4] excellent monograph entitled *Les mycetomes*, but one has failed to find any work giving a similar description of these botryomyces.

Further, the clinical appearances of three of the tumours certainly support the streptothrix theory of this disease. Before concluding, reference may be made to the amoebic theory of the disease put forward by Bureau and Labbé.[5] These observers found in a case of botryomycosis of the finger a large amoeba measuring 50 to 60 μ, thus apparently confirming Letulle's[6] previous view that possibly botryomycosis is amoebic in origin. Several staining methods have been employed with the view of confirming, if possible, Labbé and Bureau's amoebic theory, but so far without success. Certainly it is difficult to associate such a large amount of destruction of dense tissue as is met with in botryomycosis with the presence of an amoeba.

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THE EFFECT OF A MOSQUITO NET ON THE AIR WITHIN IT.

(BASED UPON EIGHTY ANALYSES OF THE AIR INSIDE AND THE AIR OUTSIDE THE NET.)

By G. DUNCAN WHYTE, M.B.Edin., D.T.M. and H.Cambs., Swatow, China.

[ABRIDGED.]

IT might be thought at first that this question was one of theoretical interest rather than of any practical value, but in these days when "plenty of fresh air" has become a household phrase, when the "open-air treatment" is still the most generally approved method of treating tuberculosis—in these days it must be obvious that it is a matter of considerable importance if (in spite of thorough ventilation of the bedroom) the air which one breathes when sleeping within a mosquito net is hourly becoming increasingly vitiated.

If in the case of a healthy European—who only lies within his net for six to eight hours nightly—this constant breathing of increasingly impure air has a bad effect, how much more powerful will the evil influence be in the case of a sick native who lies within his mosquito net all day and every day! The effect will be further increased if, as in many Chinese families, there are several occupants of the same bed.

In studying the effect of a mosquito net upon the air within it attention was therefore concentrated upon these two points, namely: (1) The percentage of carbon dioxide in the air inside the net, and (2) the amount of organic matter contained therein. The other points wherein expired air differs from pure air, namely, added moisture and increased temperature, are obviously of small moment.

Whether the air was being examined for carbon dioxide or for organic matter, the air sample was secured in the same way. Specimens of the air inside the net were obtained by taking a 5-litre jar full of pure water and emptying it of its contents within the net, so that the air inside the net took the place of the previously contained water. The test solution was also introduced while the bottle was still inside the net. Specimens of the air of the room (outside the net) were obtained in a similar way. In each case the air sample was obtained between 6 and 7 a.m. The same bedroom and the same mosquito net (one of coarse native manufacture) were always used, and the bed was only occupied by one person. The entire capacity of the room was 1,500 ft., and the cubic capacity of the net 80 ft. In calculating results, due allowance was made for variation in temperature and barometric pressure.

Amount of Carbon Dioxide.—In investigating the amount of carbonic acid within and without the net, the barium hydrate test was used. For carbonic acid air tests were made on thirty occasions.

When the investigations were begun the air of the room was examined—as a "control"—on each alternate night, the state of window, door, etc., being the same as on each preceding night, when the air *inside* the net had been examined. Later on, arrangements were made for both these examinations to be made simultaneously. During the period when the comparative tests were made on successive nights the air within the net showed frequently a higher percentage of carbon dioxide than the air outside. The difference was but slight, however—the air inside the net containing only from 2 to 5 per cent. more CO_2 than the air of the room—and might be attributed to alterations in the direction and force of the wind. When the comparative tests were made simultaneously, *no difference* in the amount of CO_2 was found. One's figures for successive testings differed from day to day according to the state of doors and windows, but the air inside the net contained no more carbon dioxide than that outside.

One would not venture to generalize on the result of only thirty tests were it not that, although not one showed an appreciable difference that could be attributed to the mosquito net, all the tests proved sensitive to each alteration in the state of ventilation.

The Organic Matter.—In testing the effect of the mosquito net in retaining organic respiratory products, the Forchammer process was applied to 100 c.cm. of distilled water shaken up vigorously for five minutes in a 5-litre amber coloured jar of air.

The tests were conducted in identical fashion each day. The *absolute* amount of oxygen absorbed from the potassium permanganate varied on different days, but as regards the *relative* amounts of organic matter contained by the air inside and that outside the net, all the figures agreed—agreed in showing throughout fifty analyses that the air within the net contained about twice as much organic matter as the air outside.

In cold weather the organic matter contained in the specimen obtained from the air inside the net only absorbed from 0 11 mg. to 0 23 mg. (average 0 16 mg.) of oxygen, but the specimen obtained from outside the net failed to absorb any oxygen at all. This average figure and each of the following averages is based on six double analyses, that is, twelve examinations.

In warm weather—35° to 37° C.—a certain amount of potassium permanganate was decomposed in each specimen, but that from inside the net always showed the presence of more oxidizable organic matter. More oxygen—from 0 2 to 0.7 mg. more—was always required to oxidize the organic matter contained in the specimen from within the net.

(*a*) When the bedroom was well ventilated the specimen from the air *outside* the net absorbed on the average 0.13 mg. of oxygen in six hours at a temperature of about 30° C., while the specimen corresponding to the *inside* of the net absorbed 0.59 mg. of oxygen when exposed to similar conditions.

(*b*) When, on the other hand, the room was ill-ventilated and the air of the room was very impure, 0.41 mg. of oxygen was required to completely oxidize the organic matter contained in the specimen derived from the air *outside* the net, but twice as much oxygen was required —0.80 mg.—for the oxidation of the specimen from the air *inside* the net.

(*c*) A similar difference—outside 0.39 mg , inside 0 65 mg. —between the amount of potassium decomposed is shown when, only the window being open, the room was only moderately ventilated.

If one assumes that *all* the organic matter contained in the air in the 5-litre jar is absorbed by the 100 c.cm. of water, one may state the above results in another way, and say that: When the room was ill-ventilated, organic matter was present in the air of the room to an extent that would have required 0.0075 part of oxygen for the complete oxidation of every 100,000 parts, but the air inside the net would have required 0 014 part—that is, about twice as much—for the complete oxidation of its organic matter.

It may seem to some that this effect of the net upon the air breathed is insignificant, but such an impression is due to the limited power of figures to express adequately the results of the investigation. One must not take this last figure (0.014 part of oxygen required for the complete oxidation of 100,000 parts of air) and say, "There were only 0.014 part of organic impurity in the air." Such a statement is quite unjustifiable. Of all the impurities in the air only a certain proportion were absorbed by the distilled water; only some of the impurities thus absorbed were incompletely oxidized, and these incompletely oxidized impurities are the only ones that possess the power to reduce potassium permanganate. Thus it is only of a fraction of a fraction of the impurity of the air that we have been able to make a rough estimate by this modification of Tidy's process.

In spite of this limitation, if water from a well were found to contain as much oxidizable organic matter as the specimens of distilled water that had been shaken up with the air inside the net, and if no further tests were possible, the well would assuredly be condemned as "unfit for drinking purposes"; but the individual sleeping within the mosquito net has been inspiring this impure air for the last few hours of his sleep!

One would not dream of questioning the value of a mosquito net for the freedom it gives both from the irritation of mosquito bites and from malaria, filariasis, and dengue, but I think our eyes should be open to the harm that is being wrought by the net simultaneously.

We have not done our best for a patient when we have obtained ample ventilation for the bedroom, unless we have also secured that he is no longer poisoning himself by inhaling the waste products that are accumulating within his mosquito net.

In some cases of tuberculosis it will be found best to dispense with the net and make use of preparations of oil of citronella, etc., to secure freedom from mosquitos.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

NEEDLE PENETRATING ABDOMINAL WALL AND ENTERING INTESTINE: EXTRACTION AND RECOVERY.

On February 3rd, 1910, a Chinese man, aged 28, was needling himself in approved Chinese style for a pain in the abdomen, when the needle accidentally slipped beyond his reach and entered the abdominal cavity. An attempt was then made by his friends to extract the needle through a small incision made with a Chinese razor, in the anterior abdominal wall, going right down to peritoneum. Into this opening they thrust filthy fingers, probing for the needle, the patient's own unwashed hands assisting in the search in the depths of the wound. After the injury the man partook sparingly of food for fear of dislodging the needle, although is caused him no pain. Pressure over the spot was painful, and there was a similar pain on defaecation, probably due to contraction of the abdominal wall in straining and consequent pressure upon the needle.

The operation did not take place until the third morning after the injury, chloroform being the anaesthetic given. It was hoped to avoid an extensive operation, so for fear of losing the needle the original wound, which was slightly to the right of the middle line just below the umbilicus, was enlarged sufficiently to admit two fingers into the abdominal cavity, and the needle was found lying transversely across the lumen of a loop of small intestine. This was brought up into the wound, and the needle extracted through the smallest of incisions. It proved to be an ordinary sewing needle, 1¾ in. in length. There was very little haemorrhage, and no ligatures were required. Drainage was provided, and the wound partly closed.

As was anticipated, an attack of acute general suppurative peritonitis supervened, with a temperature rising to 103°, quick small pulse, intense pain and tenderness, constipation, and distension of the abdomen, but there was very little vomiting. The patient looked extremely ill, and it was feared that he could not recover. Expectant treatment seemed the only resource, since the wound was draining freely, and the man had to be nursed by his own friends. Fomentations were tried, and small doses of calomel and salts, since there was little vomiting, and that soon ceased. Recovery eventually occurred, progress being gradual and imperceptible at first. On March 1st he was well enough to leave his bed, and went home seventeen days later. Four months after the injury he was in good health.

This case, besides showing the good resisting power of the Chinese constitution, illustrates also the dangers to which they subject themselves by their indiscriminate practice of acupuncture. It is a mode of treatment much in vogue here, practised by any man, woman, or child, at his or her own discretion, for any and every kind of ailment, joints receiving special attention, and even the eyeball being so treated in certain cases.

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THE TREATMENT OF SLIGHT WOUNDS BY IODINE.

Iodine as an application to abrasions, cuts, deep scratches, and the like, has been, I think, but little exploited; I therefore venture to suggest the following method of using it in such cases—a method which I have used extensively in practice for over eighteen months, and which offers many advantages from its extreme simplicity and economy of time and material.

As soon as possible after the occurrence, the wound, without being in any way cleansed, is painted with the following solution:

Tinct. iodi (*B.P.*)	...	...	2 parts
Ether	...	...	3 ,,

A second coat is given after about a minute. An ordinary clean camel-hair brush is used, and the application made well around the wound. No further dressing is required in cases where the wound is not liable to be soiled or rubbed (for example, wounds about the face); in other cases a simple pad of sterile gauze is used. If uncovered (and this gives the best results, when feasible), a single fresh application of the iodine is made three times a day; if covered, only twice. This method also yields very good results in impetiginous eruptions and in the treatment of boils.

I have at present under my care over 400 imbecile patients, amongst whom casualties of widely varying degrees of severity and of sepsis are necessarily of frequent occurrence, and treatment as above described has given most excellent results, which have in many instances been checked by comparison with the behaviour of similar lesions (sometimes in the same patient) under treatment with (1) sterile dressings alone, (2) boracic, and (3) cyanide gauze and perchloride of mercury dressings.

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Reports
on
MEDICAL AND SURGICAL PRACTICE IN THE HOSPITALS AND ASYLUMS OF THE BRITISH EMPIRE.

WHITEHAVEN AND WEST CUMBERLAND INFIRMARY.

A CASE OF PARTIAL GASTRECTOMY: RECOVERY.

(By G. Bertram Muriel, M.B., B.C.Cantab., M.R.C.S., L.R.C.P., Honorary Surgeon.)

The patient, a miner, married, aged 47, was admitted into the infirmary on May 29th, 1909, complaining of weakness and indigestion, which had been troubling him for eight months.

History.—He had noticed that during that time he had been getting thinner and weaker, and a feeling of weight after eating food had gradually come on. For a few months before he was admitted he had been vomiting, at first a few hours after food, and then immediately after it. Vomiting relieved his pain, but taking food never did. He had never vomited blood, nor was there any history of melaena. The ordinary treatments for indigestion did him no good.

On admission he was emaciated and sallow in appearance; temperature 98°, pulse 68, respirations 18. Abdomen not distended, but stomach was dilated a little upwards. No succussion splash. He had some arterio-sclerosis, otherwise circulatory and other systems were apparently quite healthy.

Treatment.—With rest in bed and stomachic treatment he at first improved slightly, but then signs of dilatation increased, he having visible peristalsis. Also a test breakfast revealed the absence of free hydrochloric acid and the presence of lactic acid. In addition, a light supper, in which thirty currants was given one evening, on being siphoned off next morning was little changed. A doubtful lump was then felt over the region of the pylorus, he was also having more pain and losing weight. The condition was considered to be one of pyloric obstruction, probably malignant in nature.

Preparation for Operation.—For five days prior to the operation the patient was dieted on peptonized milk and Benger's food, these being sterilized. He was also given an antiseptic mouth wash. Liquor strychninae ♏ v. was given four times a day. The stomach was repeatedly washed out, the last time being one hour before the operation. At this latter time an enema of 10 oz. of normal saline solution with 1 oz. of brandy and liquor strychninae ♏ x also being given.

Operation.—June 16th, 1909. A small mesial incision was made above the umbilicus and a preliminary examination made. The pylorus was found to be very hard and thickened, and apparently carcinomatous. It was wonderfully freely movable, however, and it was considered to be the right thing to do to remove the growth, with about two-thirds of the stomach. There were glands, but none were very large, and they also were not fixed. The incision was enlarged up to the ensiform cartilage above, and down to below the umbilicus. The rest of the abdominal cavity was carefully shut off by flat sponges, the stomach and growth being drawn out as much as possible. The gastro-hepatic omentum, together with the coronary artery, was tied, and the lesser curvature of the stomach freed to the duodenum well beyond the growth. The duodenum was then clamped by two clamps and divided between the clamps, the superior pyloric and gastro-duodenal arteries being also tied. The distal end of the duodenum was then closed by a double suture—first a continuous one through all its coats, and then a sero-muscular suture outside that, as recommended by Mr. Moynihan. The great omentum was next tied off well away from the stomach, and so as to remove quite two-thirds of this organ. The stomach was now clamped at this point with two clamps, divided and sutured, as the duodenum had been, by double sutures, two Halsted stitches being also put in at each end of the division. A posterior gastro-enterostomy was then performed and the wound closed up.

After-Treatment.

The patient was returned to bed and his head slightly raised. Pulse 108, respirations 26, temperature 98°. Every three hours he had an enema of normal saline solution half a pint, brandy 6 drachms, and adrenalin half a drachm. These were continued for three days, and then given for two days longer every five hours. He was gradually propped up more in bed, and next morning, as there was no sickness, he was given by the mouth ʒss. albumen water every half-hour. During the day and next evening he brought up, without retching, on several occasions mouthfuls of blood-stained fluid. For this he was given adrenalin ♏ xv, aqua ad ʒj, every half-hour for three hours. The fluid by the mouth was gradually increased, so that by the fourth day he was taking ʒiv of peptonized milk, whey, albumen water, meat extract, cream, or Allenbury's No. 3 food every hour. On the fifth day he had some milk pudding, and after the first fortnight a little minced meat. On the second day after the operation he strained violently with retching, and the abdominal suture gave way, completely re-exposing the stomach. He was given ether, and the wound stitched up again, and it healed by primary union without further trouble. For the first two days there was considerable shock. Pulse 120 to 132, respiration 30, temperature 102° to 99°. The temperature remained from 99° to 100° for a week longer, then became normal, and the pulse fell to 95, at which rate it remained until he was discharged.

As a further complication it should be mentioned that four days after the operation he had a general convulsion, which lasted about a minute, and subsequently he had two to three a day for five days. It was considered that this was due to arterial spasm, he having a high blood pressure and his brachial arteries being decidedly atheromatous. Potassium iodide and bromide relieved the condition.

The patient got up five weeks after the operation, wearing temporarily an abdominal belt, and he was discharged from hospital on August 5th, having an exceedingly good appetite, and expressing himself as feeling better than he had done for years.

After-History.

He remained well for several months, despite the fact that on one or two occasions he gave way to some excess of drinking. In January, 1910, however, he showed signs of recurrence apparently in the wound, which became very indurated, a hard mass being felt in the whole of the scar extending deep down in the wound to the stomach. He also had persistent vomiting. He gradually got worse, and died on March 13th of this year—nine months after the operation.

Further Notes on the Case.

At the operation a diagnosis of carcinoma seemed absolutely certain, and the previous and after-history of the case apparently confirmed this. However, microscopical examination of the growth was not so certain. A piece was sent away for investigation, and the report thereof stated that "it showed the mucous membrane and muscle to be infiltrated by small round cells, like lymphocytes, without any evidence of destruction of tissue."

I think, however, the subsequent history leaves no doubt as to the nature of the disease. I regret that a *post-mortem* examination was not obtainable. The general interest of the case has tempted me to report it.

Reviews.

ORTHOSTATIC ALBUMINURIA.

This essay by Dr. Fritz Götzky on orthostatic albuminuria contains the result of a prolonged study of twelve cases undertaken at the suggestion of Professor Heubner, in whose wards the work was carried out.[1] Dr. Götzky says that in spite of many careful studies the subject is still obscure, but the work of Heubner and Langstein has placed its non-inflammatory nature beyond doubt; the work to which he refers was apparently published in a volume of Professor Heubner's, entitled *Die chronischen Albuminurien im Kindesalter, Ergebnisse der Inneren Medizin und Kinderheilkunde*, and is not generally known in this country. He appears to have been able to follow a case of orthostatic albuminuria to the *post-mortem* room, and to have proved that the kidneys were absolutely intact. The history of the subject dates from the statement made by Sir William Gull in 1873 at a meeting of the Royal Medical and Chirurgical Society, where he is reported to have said that "albuminuria was frequent in boys above puberty but was not found out because it was not looked for, but in weak, delicate persons the urine might be loaded with albumen; what was the cause he could not say." The condition was afterwards the subject of a well known paper by Dr. Moxon, but it was Dr. J. Morley Brooke, of Cheltenham, who first drew attention to the influence of rest in the recumbent position in causing the disappearance of the albuminuria (British Medical Journal, October 19th, 1878). In his paper he said, "when the body is in the upright position the weight of the column of blood is too much for the weakened vessels." Dr. Götzky has omitted this bit of history, which is important, as it is the influence of position upon the albuminuria of young persons which has been recognized of late years to be the dominant factor in its production. But he notes the work of Moxon and Pavy, and that of Leube and Posner; he admits that we are still ignorant of the reason why healthy kidneys excrete albumen, but he mentions von Noorden's theory of a non-assimilable albumen which is excreted by the kidneys, and his reference to the frequency with which the albumen in these cases is precipitated by acetic acid. Recent investigations have shown that precipitation by acetic acid is probably the result of a combination of the proteid with other substances, and has no definite pathological significance. The most interesting experiments quoted are those of Erlanger and Hooker on the effect of increased venous pressure in causing albuminuria, and on the influence of lordosis of the lumbar vertebrae as a cause of venous obstruction; the critical angle was 40°, and the lordosis had to be sufficiently great to stretch the abdominal muscles. Orthostatic albuminuria disappeared when the body was upright in water or when upside down, or when the lower part of the body was encased in pneumatic trousers under a pressure of 50 mm. Hg., the albumen appearing when this pressure was removed. Jehle has called the condition "lordotic albuminuria" in order to give prominence to the lordosis, as he holds that all the conditions found to produce albuminuria in orthostatic cases produce lordosis, and when lordosis is prevented albuminuria is absent, and albuminuria can be shown to follow lordosis even when the body is in a horizontal position. But if the lordosis can be produced without causing obstruction there is no albuminuria, as when the body is placed in a horizontal position in lordosis with the legs higher than the head; he believes that he has proved that venous obstruction is the essential cause, and he would explain in the same way the albuminuria of pregnancy and that which follows cold bathing. Götzky's observations were on twelve cases in which the condition of the urine was observed from day to day, and almost from hour to hour; the patients were made to pass water five or six times a day, and the samples kept distinct and examined separately. Seven of the cases were true orthostatic albuminuria in which, so long as the patient was in the horizontal position there was no albumen in the urine, but on getting up the albumen appeared; there were no casts, except in the seventh case, which had a slight intercurrent attack of nephritis due to diphtheritic infection, but it is noteworthy that after it passed off pure orthostatic albuminuria recurred. In all seven cases, when the patient was in the horizontal position, albuminuria could be caused by inducing lordosis. The other five cases were examples of what Heubner calls "chronic nephritis of children," and were distinguished by the presence at times of albuminuria when recumbent, and of casts. Dr. Götzky quotes statistics as to the relative frequency of the condition as influenced by sex and age, and he summarizes the general symptoms which are commonly observed in connexion with it. With regard to lordosis, he points out that there are many cases of orthostatic albuminuria which have no lordosis, and that there are many lordotics without albuminuria, giving a list of seven cases observed by him. He emphasizes the importance for diagnosis of excluding the "chronic nephritis of children" and tuberculous nephritis; this may be done by the microscope and by looking for tubercle bacilli. He agrees with the general view that the prognosis of these cases is favourable if we allow for the fact that many occur in children of debilitated constitution. He thinks there should be no special treatment for the albuminuria, but recommends careful supervision of the clothing, avoidance of damp shoes, and interdiction of violent exercises—swimming, skating, and, according to Heubner, of cycling, rowing, and riding. The monograph deserves the attention of those interested in this subject.

[1] *Zur Kenntnis der orthotischen Albuminurie.* Von Dr. Fritz Götzky. Berlin: S. Karger. 1910. (Sup. roy. 8vo, pp. 193; M. 5.)

URIC ACID AND DISEASE.

This book, which is entitled *Uric Acid in the Clinic*, is an endeavour on the part of Dr. Haig to record some part of the clinical material upon which he based the conclusions to be found in his larger work on *Uric Acid as a Factor in the Causation of Disease*, and in fact he gives it the subtitle of a clinical appendix to that volume.[2] After describing the principal methods he employs for clinical investigation, including his capillary dynamometer for measuring the capillary reflux and his colour card for determining the blood decimal (that is, the proportion of haemoglobin and blood cells), and explaining his method of classifying diseases according as they are due to (1) "collaemia," or the obstruction of the capillaries by the presence of uric acid, and (2) the precipitation or retention of uric acid in the various tissues or organs of the body, which includes all that would be ordinarily called local gout, he prints formidable lists of diseases under both headings and explains how in his view various factors react on the constitution by producing one or other of these conditions. For example, speaking of the effect of climate, he treats its influence as mainly in causing retention or solution of uric acid. After this explanatory and introductory portion, he gives the notes of cases under these headings, with comments upon them. The first, and by far the most important, chapter is on headaches, for which Dr. Haig has unquestionably been successful in indicating a valuable method of treatment. His own case was most instructive and that of his son which he gives in the present book is equally so. Many similar cases are susceptible of benefit by treatment on these lines. On the other hand, his account of the treatment of other diseases is less convincing, for example, epilepsy, neurasthenia, mental depression, etc. A purin-free diet is useful in many conditions besides migraine for which it was originally devised, and it benefits some cases of epilepsy and many of Bright's disease, but it is not a panacea. Speaking generally, the notes of the cases are too brief to enable us to discuss them. We wonder what is meant by such a statement as "the stomach is down to the umbilicus and there is a slight splash" or "the stomach is

[2] *Uric Acid in the Clinic.* By Alexander Haig, M.A., M.D.Oxon.' F.R.C.P., and K. G. Haig, L.R.C.P.Lond., M.R.C.S.Eng. London J. and A. Churchill. 1910. (Med. 8vo, pp. 306; 5s.)

down nearly to the umbilicus"? Are these to be regarded as abnormal physical signs or not? On page 89 a native of India is made to say that native soldiers in India eat 3 lb. of beans a day! There is surely some mistake about this; 3 lb. of *rice* would be a large amount, and the daily allowance of beans or dhal would not exceed half a pound.

URINARY THERAPEUTICS.

THE latest addition to the Library of Therapeutics, edited by Gilbert and Carnot, *Thérapeutique urinaire: Reins: Vessie: Uretère: Urètre: Organes génitaux de l'Homme*, deals with the diseases of the urinary system, including the male genitals, and is the joint production of two physicians, Drs. ACHARD and PAISSEAU, and a surgeon, Dr. MARION.[3] The result of their labours is a cyclopaedia in miniature. It is really remarkable how much the authors have managed to crowd into the small space between these covers without being "scrappy." The section dealing with nephritis should prove valuable to consulting physicians and general practitioners alike, for the authors have been at pains to go into minutiae concerning the various régimes proposed by theoretical considerations such as the desirability of excluding chlorides from the diet; they give not only data from physiological and pathological examples, but even go the length of suggesting daily menus; they discuss the general and special treatment of the various types of nephritis, and also of particular aspects and incidence of the disease; for example, the dangers as well as the advantages of mercury in the nephritis of syphilis are displayed, and again the symptomatic basis of lumbar puncture as a measure suitable for coma is indicated. The surgical section of the book, from the pen of Dr. Marion, extends to more than three-quarters of the whole. It deals not only with hygienic and pharmaceutical remedies but also with the technique of operations. The student who has read this little compendium will be familiar with most of the conditions he is likely to be called upon to treat, and if he follows the author will not wander from the paths indicated by sound notions of pathology. So far, too, as all the smaller operations go he can rely on the directions he has here given, but of course for complicated procedures such as are required by plastic operations he will be obliged to supplement his information. The principles of the use of the catheter, the urethroscope, and the cystocope, and methods of irrigation are clearly inculcated; a formulary is appended which should prove useful even though a good many of the drugs are not to be found in the *British Pharmacopoeia*. Altogether a capital little book.

OLD AGE AND LONGEVITY.

THE subject of old age is one which possesses universal interest for mankind, but though speculation has afforded many explanations of its occurrence, and has suggested numberless plans to delay its advent, it still remains true that the measure of a man's life is three score years and ten, and that this limitation is probably the approximate gauge of average human tissue resistance to the processes of degeneration which are constantly going on as part of the wear and tear of daily life. Among the most recent treatises on the subject is one entitled, *Vieillesse et longévité*,[4] from the pen of Dr. P. ROESER of Paris, in which an attempt is made to focus much of what has already been written on the subject, and to present the reader with a concise and well-arranged epitome comprising the views of many previous writers, as well as those of the author himself.

The volume is divided into three parts, of which the first is devoted to etiology, the second to anatomy and physiology, and the third to therapeutics. It is pointed out that the intestine is the seat of manufacture of many poisons, the absorption of which depends upon a variety of indeterminable circumstances. Some poisons so formed, says the author, are at once cast out of the body, and their absorption is exceptional; others are absorbed and immediately neutralized by the formation of antitoxins; while others, again, provoke no antitoxic reagent, but are tolerated by the organism at the cost of gradual impairment, both in function and structure of the living cells. Abnormal autointoxication only results when the intestinal mucous membrane is either functionally feeble or the seat of organic change. Toxins find their point of entry from many other sources than the intestinal tract, but from whatever origin they are derived, the ultimate result is to promote the approach of senility by a gradual enfeeblement of cellular energy. Failure of vitality varies in intensity according to individual proclivity, inherited tendency, and hygienic environment, but is powerfully augmented by habits of excess, especially those that involve alimentation. When discussing the influence of an overfilled stomach on tissue degeneration, the author suggests that more attention should be directed to the effect produced by this viscus, when distended, upon the solar plexus. He thinks it not impossible that, entirely apart from toxaemic absorption, such pressure may be often responsible for capillary disturbance in the various organs which derive their innervation from this source, and that the vasomotor instability thus produced may play no unimportant part in cellular instability.

Dr. Roeser, while advocating strict moderation in dietetic habits for those who desire to attain to old age, is no supporter of fads and fancies. He has no toleration for exclusive regimens, but believe that every man must find out for himself his dietetic limitations and by daily self-denial keep himself well within the boundaries of his digestive and absorptive capacity. He deprecates the exclusion of animal food as a means of prolonging life, and gives sound reasons for regarding a vegetarian diet as totally unsuited for the ordinary individual. He believes in the value to be got out of alcohol, especially in the form of wine, when used wisely, and discourages total abstinence as a habit, except under circumstances peculiar to the individual.

His researches offer no panacea for securing a prolongation of life, but they strengthen the generally accepted view that the attainment of old age, though influenced by many conditions, both congenital and acquired, is otherwise a consummation largely dependent upon frugal habits, accompanied by a philosophical spirit of contentment with things as they are; to use Dr. Roeser's own words: "La seule recommandation—et elle s'addressera encore plus aux adultes, et même aux jeunes gens, qu'aux vieillards—sera de s'habituer à la modération en toutes choses, aussi bien dans l'alimentation, quelle qu'elle soit, que dans les exercices du corps, et dans toutes les pratiques capables des produire la fatigue. Ainsi on se préparera une vieillesse plus tardive, exempte de maladies, et une vie plus prolongée."

CORRECTION.—In the fourth line of the review of Dr. Stelwagon's *Essentials of Diseases of the Skin, including Syphilodermata*, published in the BRITISH MEDICAL JOURNAL of September 24th, p. 882, "Lumsden Question Compends" should have been "Saunders's Question Compends."

NOTES ON BOOKS.

WASTAGE OF CHILD LIFE.

IN his pamphlet on the *Wastage of Child Life*,[5] Dr. J. JOHNSTON offers a concise and withal eloquent summary of most of the admitted factors which go to produce our still disgraceful infant mortality and the well-known degeneracy of the industrial classes in the present and the rising generation. His arraignment of the "half-time" system would be especially valuable if only it could penetrate to the ears of those to whom it is mainly addressed, that is, the working men who not only tolerate but resent any interference with the exploitation of the labour of their own children. Although published under the auspices of the Fabian Society, the book is purely critical and expository, and brings together a number of important facts and statistics in a very small and convenient compass.

[3] *Thérapeutique des maladies urinaires.* By Drs. Achard, Marion, and Paisseau. Paris: Baillière et Fils. 1910. (Post 8vo, pp. 516; fully illustrated; 204 figs. Fr. 12.)

[4] *Vieillesse et longévité.* Par le Docteur P. H. Roeser. Paris: A. Maloine. 1910. (Post 8vo, pp. 320. Fr.4.)

[5] *Wastage of Child Life as Exemplified by Conditions in Lancashire.* By J. Johnston, M.D. Fabian Socialist Series, No. 7. London: A. C. Fifield. 1909. (Cr. 8vo, pp. 95. 1s.)

Nova et Vetera.

A MEDICAL DIPLOMATIST.

The recent death of Florence Nightingale naturally reminded us of the Crimean War, and the terrible hardships endured by the allied armies during that disastrous campaign. Whilst fully recognizing the inestimable value of the noble work accomplished by the Lady with the Lamp and her devoted band of followers, it is fitting that we should recall the memory of Sir John McNeill, who did at least as much to lessen the sufferings of the sick and wounded. In striking contrast to the brave woman who was his firm friend and ardent admirer to the end, he received the usual reward of the reformer—ingratitude and non-recognition during life, and afterwards complete oblivion. Yet Sir John McNeill deserved a better return for his labours; even apart from his work in the Crimea, he has a claim on the gratitude of Englishmen. It might with truth be said of him that he devoted his life to the welfare of his country, for almost the whole of his long career was spent in unceasing toil on its behalf; and the man who later was to be set aside and see his work disregarded, endured years of constant hardships and anxiety, and the loss of child after child, and the ruin of his own health in his successful and unremitting endeavour to further British interests and uphold British prestige in the East. An account of his life has been published recently by his grand-daughter,[1] whose charmingly sympathetic account of her grandparents forms a fitting memorial to one who was not only an able and successful diplomat, but a devoted husband and father, an upright and honest gentleman, and an ornament to the medical profession of which he was a prominent member.

Sir John McNeill was born on the island of Colonsay, on August 12th, 1795. He was the third child of John McNeill, Laird of Colonsay, and came of an ancient Highland stock, which claimed descent from Torquill McNeill of Taynish, who was Keeper of the Castle of Sween in Argyllshire about the middle of the fifteenth century. In course of time the Keeper's descendants appear to have acquired considerable landed property, but it was not until the year 1701 that the islands of Colonsay and Oronsay came into the family by means of a "Disposition" from the Earl of Argyll. The story goes that the McNeills consolidated their new possessions by the simple if barbarous process of massacring the former owners, who belonged to another clan. John McNeill spent the first eleven years of his life in his island home, for which, throughout all his wanderings in after-life, he always cherished an intense affection. He was a delicate child, with a tendency to consumption, which seems to have been overcome by the healthy outdoor life he led during his boyhood, since he grew up a very strong and very active man. His mother, an extremely able woman, had charge of his education till he left home for the first time to be boarded, probably as a private pupil, with the Rev. George Jardine, M.A., Professor of Logic at the University of Glasgow. Thence he passed on to St. Andrews, where he won the good opinion of his teachers. In 1811 he proceeded to Edinburgh to study medicine. He received the degree of M.D. in 1814, at the age of 19; and in the same year he married, much against the wishes of his family, Innes, the fourth daughter of George Robinson of Gask and Clermiston, a girl three years his junior. This hasty marriage was followed by two years of poverty, but in 1816 his father obtained for him an appointment in the East India Company. Six months after his departure from Scotland the young husband was left a widower, and the next three years were spent on active service.

From an early period in his career McNeill seems to have extended his activity beyond the sphere of purely medical work. His grand-daughter, quoting from a note made by himself, tells us that

> during the campaign Mr. McNeill was employed in various duties—communicating with native chiefs, heads of villages, and others, and sometimes in negotiations with chiefs of tribes who had the power of giving annoyance or of interrupting communications. He was frequently directed to accompany detachments sent to a distance, in order to facilitate their intercourse with the native authorities, obtain information, procure trusty guides, get supplies, etc.

It is clear that, even at this early period, the young doctor was giving striking proofs of his exceptional capacity for diplomacy, and his appointment as Assistant Surgeon to the British Mission at Teheran towards the end of the year 1820 gave him full opportunities of perfecting himself in the rules of that art. He did not neglect to profit by them, and it was not long before the new assistant surgeon became a man of mark in the little English colony. Thanks to his absolute integrity, and to his never-failing tact and good judgement, McNeill was soon the right-hand man of his superior officers, and during the fourteen years of his sojourn at the Court of Persia he was always "in the confidence of, and a great assistance to, three successive Envoys. He knew far more about Persian politics than any living Briton, and his diplomatic talents seemed to fit him especially for the first position himself." Small wonder, therefore, when he returned home in 1834, "the poor and little known Medical Assistant had developed into a prominent diplomat, whose opinions were listened to with attention, and whose rôle it would be in future to confer favours rather than to receive them."

It must not be imagined, however, that McNeill's interest in Eastern politics absorbed his whole attention to the detriment of his own profession. We learn that, more particularly during the first years of his appointment at Teheran, he did his utmost to encourage vaccination, and devoted much of his leisure to the study of cholera, at that time but recently introduced into Persia. But there can have been no doubt in the minds of those who knew him that his real vocation was diplomacy; and when he returned to the East, in June, 1836, it was as "Minister Plenipotentiary and Envoy Extraordinary from the Court of St. James's to the Shah of Persia." Two little incidents which took place on the voyage out, when his honours were new upon him, deserve mention for the characteristic picture they afford of the man himself:

> As he was embarking at Dover he heard some guns firing, and criticized the irregularity of their practice, but quite forgetting that they were the usual salute to one of His Majesty's Ministers leaving the country, and were therefore fired in his honour. The first act on reaching Boulogne was to "ferret out" an old Indian friend who was living there after being ruined by bank failures, and for whom he had been making efforts in London.

This is hardly the proper place to discuss at any length McNeill's career as British Envoy. It may be fitly summed up in the words of his biographer:

> When Mr. McNeill left England in June, 1836, his hope had been to carry out the instructions given him regarding the Commercial Treaty, etc., and to have left Persia for good in two years, feeling that British prestige was restored there. He was now leaving it after two and a half years of great anxiety and a seeming failure, his hair whitened, his health broken, but with the knowledge that he had done his best, and with the satisfaction of knowing that Lord Palmerston considered he had done the best possible.

"His best" included the saving of the city of Herat, after a nine months' siege, by means of which he successfully again put off the day when Britain should acknowledge Russia as the paramount Power in Persia.

In 1842 Sir John McNeill, G.C.B., as he now was, was compelled by the state of his health to leave Persia for good, but it was only to devote himself to fresh work at home. With the same zeal that he had displayed in his political duties he now gave himself up to work of another and more philanthropic nature. He became Chairman of Her Majesty's new Poor Law Department, the Board of Supervision for Scotland, and was appointed head

[1] *Memoir of the Right Hon. Sir John McNeill, G.C.B., and of his second wife, Elizabeth Wilson.* By their Grand-daughter. Published by John Murray, Albemarle Street, London. 1910. (Pp. 417.)

of the Highland Emigration Society. Sir Henry Rawlinson, whose words are quoted here, says of him that "it was partly owing to his (McNeill's) admirable management that the famine of 1847, which decimated Ireland, was so little felt in the sister island."

But Sir John McNeill's great work was yet to come. The terrible mismanagement in the Crimea during the first months of the war, and the frightful sufferings it entailed upon our hapless soldiers, aroused a storm of indignation throughout the United Kingdom; and on February 12th, 1855, a Cabinet meeting was held, at which it was decided, amongst other resolutions, that "A Commission of which Sir John McNeill is to be head, is to be sent out (to the seat of war) to inquire into the working of the Commissariat in all its branches of supply and issue, and every other detail."

Sir John McNeill (says his grand-daughter) was at this time in his sixtieth year, and a man who was not in robust health; twenty-three years in the East and many hardships while there having left their mark upon his constitution. Yet he did not hesitate a moment. Summoned to London by telegraph, not knowing for what purpose, he was requested to undertake the proposed inquiry. At great personal inconvenience, he accepted. Two days afterwards he learned that Colonel Tulloch was to be his colleague, and in three days more they were on their way.

It was no pleasant or easy task that the two Commissioners had before them. Their instructions from the Government were extremely vague, and, though sent expressly to rectify abuses and to indicate to the authorities at home the proper course to pursue with regard to supplies, care of the sick, etc., they were, in reality, "armed with no powers beyond the taking of evidence and of making suggestions, and were in the disagreeable position of being civil Commissioners examining military men."

McNeill's first impressions in the Crimea were not unfavourable. Writing of the hospitals at Scutari, he says: "I have never seen the sick of an army in the field so well cared for"; and in a letter to Lord Panmure he writes that "it seems as if the worst were already past and everything mending."

The worst was past; but things were still in a state of confusion. The Commissioners' first act was to supply the urgent need of the army for soft bread and fresh meat. And then came a far more difficult and unpleasant task—the inquiry into the cause of mismanagement. The two Commissioners

sat, sometimes on board the steam-transport *Gothenburg*, and sometimes in a hut at the camp, for fifty-five days, taking evidence, and patiently recording and collating it. They examined, either separately or collectively, the Commanding Officer, the Surgeon, and the Quartermaster of every Corps in the Crimea; also officers commanding brigades and divisions; principal medical officers and commissariat officers attached to brigades and divisions; and, finally, the Quartermaster-General, the Senior Assistant Quartermaster-General, the Commissary-General, and the two Deputy Commissaries-General—over 200 officers in all.

Though McNeill did all that lay in his power to make this cross-examination as little offensive as possible, it aroused furious resentment on the part of the officers interrogated. In a letter to his wife, Sir John tells us that the principle upon which he worked was

to keep in the background myself, and privately to push on the Commissariat, and let them do everything as if on their own movement. In this way I get hearty co-operation instead of opposition, and what I want is *to have the thing done* without seeking to have the credit of doing it.

The result of the inquiry was embodied in two reports—one finished in June, 1855, and the other in January of the following year—which were drawn up with infinite care by McNeill and Tulloch, before being sent home to be laid before Parliament.

Every fact stated in it was verified, a reference in the margin in each case being made to the evidence of the officers, which was printed at the end, and the returns were given in an appendix separately. The evidence was given in the words of the officers themselves, was revised and corrected by them at their leisure, in their own quarters, and attested by their signatures.

There was a good deal of delay before the reports appeared, but when they did they caused a tremendous sensation. Though the tone throughout both was studiously moderate and impartial the evidence of the officers themselves made it impossible not to implicate several of those who had been in command during the war, and who were naturally incensed at the charges brought against them. The public, on the other hand, were full of indignation, which found expression in the House of Commons, at the alleged carelessness and incompetence on the part of these officers, whilst the Queen and Prince Consort were alarmed lest the army should in consequence of these revelations be placed under the control of Parliament instead of the Crown. The situation of the Cabinet, between those conflicting interests, was an extremely awkward one.

The choice was forced upon them of upholding their own Commissioners by assuming an attitude hostile to the army and displeasing to the Crown, or of denouncing the Report of their own Commission, facing hostile motions in the House of Commons, while satisfying "those in high places" and the army.

In these circumstances it was considered advisable to hold an inquiry on the reports themselves, and a "Board of General Officers" was formed for the purpose. No intimation of these proceedings was given to the two men most intimately concerned with them.

Up to this time not one line of official approval of their work had been sent to the Commissioners, nor had one word of public approval been spoken, yet Sir John McNeill . . . in spite of newspaper notices regarding the appointment of the Board of General Officers, and the curt refusal of Lord Panmure to reward his colleague, believed it impossible that the Government would not see that justice was done. . . . Still no communication was made to the Commissioners; they were left to gather what was being done from the newspapers, along with the rest of the public.

Colonel Tulloch, roused to fury by this underhand treatment, at once rushed into the fray; but McNeill, in spite of the urgings of his friends, resolutely declined to take any steps to vindicate his position. Throughout the whole sordid business he remained proudly aloof, refusing even to leave his home in Edinburgh, lest his presence in London should prove embarrassing to the Government, which he still trusted implicitly. His advice to Tulloch to follow his example was of course disregarded; the gallant Colonel appeared before the Board of General Officers, called and cross-examined witnesses, and soon landed himself in the "inextricable maze" predicted by McNeill.

The Royal Warrant appointing the Board of General Officers was dated 25th February; they had a preliminary meeting 3rd April. At first it was intended to have held these meetings with closed doors, but the indignation in the House of Commons was so great that the Government were obliged to yield, though it was much against the Queen's wish. Eventually the first twenty-three meetings were open; during these witnesses were examined. The last twenty-three meetings were closed, and the Report was issued on 4th July, 1856. The record of the public proceedings of the Board exhibit a very great contrast in spirit to that which animated the Commissioners. . . . From the first, base motives were attributed, personal recriminations were allowed, and unfair advantages taken, and unworthy inferences were drawn. In their final Report the General Officers made deductions not borne out by the evidence, and, very obviously, were intent only upon clearing the officers of all blame at the expense of the Commissioners or of the Treasury.

The result of the inquiry into the Crimean Report was such as might have been anticipated from the first under these conditions. To put it plainly, the Government threw over the two men whose only fault consisted in a faithful discharge of an unpleasant duty, and the blame which should have been accorded to others was shifted on to the shoulders of the "damned doctors," whilst every possible means were taken to belittle and call down scorn upon them, their profession, and the work they had carried out with such signal success. Popular feeling, however, was on the side of the Commissioners, and ran very high. Moreover,

Questions regarding matters connected with the Crimean Report continued to be asked in the House of Commons; whenever any allusion was made to the Commissioners, as frequently happened, it was received with cheers; but the Government steadily resisted making any sign of approbation or mention of reward.

When at length an acknowledgement of their services was made, it was in the insulting form of £1,000 to each Commissioner, which, it is hardly necessary to add, was indignantly refused by both. Their supporters, however, continued to agitate for justice, and in the end obtained it. Though Lord Palmerston referred to the Crimean Report as "an old story of what happened two years ago," and doubted if "their (the Commissioners') services were of such a peculiar nature as to require any extraordinary recognition," the tide of public opinion had risen so high that the Ministry, for very fear, were obliged to give way before it. In March, 1857, McNeill was given his choice between a baronetcy and a Privy Councillorship, and chose the latter; whilst his colleague became Sir Alexander Tulloch, K.C.B. A letter of McNeill's regarding his own reward is worth quoting, inasmuch as it shows the attitude he adopted during the whole of this disgraceful episode. He writes:

"If they feel the necessity of doing what is right, let them act like men and gentlemen. It is beneath both their position and mine to be chaffering and huckstering like Jew old-clothes men about such matters. If they do not feel that they have made a mistake, let them keep their honours and rewards. I can live without them. I do not choose to be bid for at auction. I have not put myself up for sale.

Sir John McNeill lived to enjoy for many years the honours so reluctantly accorded to him by an ungrateful Government; and much of this time was devoted to active and useful work among his poorer countrymen. He died at Cannes on May 17th, 1883, at the age of 88, having preserved his mental faculties and his interest in public affairs almost to the end.

So far little or nothing has been said of the nature and extent of the work accomplished by McNeill during the Crimean war, a work of which it is almost impossible to over-estimate the importance. Briefly, he found the Crimea a wilderness of disease and death and unnecessary suffering, where men lay dying within a few miles of the food and medicine which would have saved them; and he and his companion left it with the hospitals, the commissariat, and the transport system in perfect working order. It was McNeill who first obtained fresh meat for the starving soldiers by the simple process of having it sent from the southern side of the Black Sea, a country well known to him.

He made use of the British Consuls there, asking them to have tenders sent in to the Commissariat officials, who had hitherto made no use of this rich district so near the seat of war, and capable of supplying fresh meat, forage, fuel, and vegetables, in quantities sufficient for a much larger army than that which lay before Sevastopol.

The scurvy-stricken men, whose diseased gums rendered impossible for them to eat the hard biscuit which formed part of their daily rations, were supplied with soft bread from the field bakeries immediately erected by the Commissioners, an obvious solution of the difficulty which seems never to have occurred to those in command. It was McNeill, too, who was the first to discover "incidentally that the supply of quinine which should have been in Balaclava was practically non-existent. As the warmer weather approached, cases of malarial fever became frequent, and but for his 'timely discovery' and for 'the steps he had taken to call attention to it,' as Lord Raglan said in his letter of thanks, the troops would have been without this valuable drug."

Perhaps the result of the Commissioners' joint labours is best described in the words of one who had been an eye-witness of the state of things both before and after their inquiry.

General Sir De Lacy Evans, who had commanded a division during the war—and was for that reason, at the Queen's express wish, excluded from the Board of General Officers—defended the Crimean Report in Parliament, and testified in vigorous terms to the beneficial changes which its authors had effected during the short time they were at the seat of war:

I must say that the comment of the hon. gentleman the Under-Secretary of State for War, as the representative of Government, as well as the conduct of the noble Lord the War Minister, towards these Commissioners is the most ungrateful and unjust that I ever heard of. . . . The noble Lord at the head of the War Department said: "See what a vast superiority there is in the material state of the army in the present year as compared with last year!" He carefully omitted saying how it was brought about. . . . I now most distinctly say that it has been mainly brought about by those Commissioners whom the hon. gentleman has this night been instructed to deprecate and disgrace. . . . Who was it also that caused fresh provisions to be sent for along the various coasts of the Black Sea and the Bosphorus? Why, the Commissioners! There were fifteen hundred miles of coast along the Black Sea, and upwards of a thousand along the Bosphorus, covered with cattle and provisions; there never was an army in the world that had such vast means of transport at its command: we had unlimited command of the sea and an enormous amount of vessels at our disposal, and although these things were known, it was the Commissioners who have been disparaged to-night who first convinced the Government of the facts. I speak therefore of the Commissioners with gratitude because of the material benefits which they conferred upon the troops. . . . I rejoice that the Government have committed the gross blunder, injustice, and inconsistency that they have upon this occasion by publishing those Reports, because, independently of the proceedings of the Commissioners having saved the lives of some thousands during the last six or eight months, and having immensely contributed to the efficiency of the troops, the Reports of the Commissioners . . . will remain on record, as a menace to Governments who may be willing to place favourites instead of competent men in high stations, and will point to the staff, commissariat, and military of other armies, and perhaps of other ages, what ought to be done to protect the lives and health of an army in the field.

One who had even a better right than General De Lacy Evans to speak with authority on this subject did not hesitate to call the work of the two Commissioners "one of the noblest labours ever done on earth." In the same letter in which she pays this generous tribute of admiration, Florence Nightingale adds:

I saw how Sir John McNeill's and Sir A. Tulloch's reporting was the salvation of the Army in the Crimea. Without them everything that happened would have been considered "all right."

Sir John McNeill was a man of fine presence—tall and dignified, with a beautiful head of long grey hair. Sir James Paget said to his grand-daughter: "He was the handsomest young man and the handsomest old man I have ever seen." His portrait was painted by G. F. Watts; and a writer in the *Scotsman* said that the painter had "found a rare type in one who was considered the handsomest man of his day."

We cannot conclude this account of Sir John McNeill's career without mentioning a curious incident which occurred long after he himself had been laid to rest. Twenty years after his death, the Christian Scientists in America paid the old diplomatist the doubtful honour of adding to the number of his descendants the leader and originator of their creed. They declared, and Mrs. Eddy herself supported the claim, that she was his great-grand-daughter, in the face of the fact that Mrs. Eddy having been born in 1821, and McNeill in 1795, her alleged great-grandfather was but 26 years her senior. In an article which appeared in an American magazine, *The Ladies' Home Journal*, of November, 1903, is the following remarkable statement:

Among Mrs. Eddy's ancestors was Sir John MacNeil, a Scottish Knight, prominent in British politics, and Ambassador to Persia. Her great-grandfather was the Right Honourable Sir John MacNeil, of Edinburgh, Scotland.

Called upon to rectify this amazing misstatement, Mrs. Eddy contented herself with a very qualified denial in the *Christian Science Sentinel* for March 12th, 1904. It is there stated that Mrs. Eddy had had the matter carefully investigated, and having obtained no positive proof that the Right Honourable Sir John McNeill was her ancestor, she requests that all others writing upon her biography shall in future observe this correction. One would like to know what is Mrs. Eddy's notion of "positive proof." This might enable us better to estimate the value of the evidence on the claims of Christian Science in regard to the healing of disease. The impudence with which an absolutely baseless statement, so easily disproved, is made is a measure at once of the Priestess's regard for truth and of the credulity of her disciples.

INTERNATIONAL CONGRESS ON DISEASES OF OCCUPATION, BRUSSELS.

(Continued from p. 888.)

The Question of Illumination.

THE influence of occupation on the eye and vision, and the lighting of workplaces generally, provided subject matter for the fourth discussion. Mr. L. GASTER, Honorary Secretary of the Illuminating Engineering Society, advocated co-operation between the medical expert, the architect, and the engineer on the question of lighting, pointing out that it was no use the engineer bringing out an efficient and economical light which would afterwards prove to be injurious to the eyesight. He discussed the effects upon eyesight of intense light on the one hand and insufficient lighting on the other, and advocated the desirability of establishing standards of lighting. He exhibited an apparatus which he claimed would efficiently measure any degree of illumination.

Dr. MASSARELLI (Rome) discussed the general principles which should regulate artificial illumination, and spoke very highly of the Cooper-Hewitt mercury lamp for use in such industries where it was not necessary to distinguish colours.

Professor GALLENGA (Parma) advocated the supervision of eyesight in trades which were calculated to cause injury, and recommended as a general principle that the eyesight of all young people commencing work should be properly tested. He discussed the trades and conditions which created or aggravated defects of vision.

Dr. WILLIAM ROBINSON (Sunderland) described the causation of glass workers' cataract, and summarized his own investigations on the subject.

Dr. A. BROCA (Paris) and Professor F. TERRIEN (Paris) also presented interesting communications.

Miner's Nystagmus.

The most animated discussion, however, took place on the consideration of the subject of miner's nystagmus. Drs. ROMIÉE and THIBERT (Liége) and Dr. MORET (Charleroi) contributed papers, the two former concluding that the affection is due to insufficient lighting, is benign in nature, and rarely interferes with ability to work. They strongly objected to the theory that nystagmus involves an increased liability to accident. Dr. Moret discussed the causation, concluding that the affection was a neurosis produced by ocular fatigue due to darkness, combined with fatigue of the muscles, notably the elevators, from the strain of looking in an abnormal direction. A number of French representatives insisted on the risk of accident from this condition, and Dr. F. SHUFFLEBOTHAM pointed out that nothing had been said respecting the subjective and objective symptoms which occurred apart from ocular symptoms.

Compressed Air and Decompression.

The first discussion on September 13th was on the effects of compressed air and the relative merits of decompression by stages or by the gradual method.

Lieutenant G. C. C. DAMANT, R.N., described the principles on which the system of decompression by stages is based, and demonstrated very clearly the success of the method from the experience of the English Admiralty during the last two years, without any accident directly due to the system, though work had been done at a depth of 62 metres. The greater the depth the less time is allowed in the water, no diver being allowed to remain more than twenty minutes at a depth of 47 metres. He considered gradual decompression an absolute waste of time. He stated that in cases where diving was likely to prove risky it was customary to provide a small recompression chamber on the diving boat.

Dr. G. WALLER (Amsterdam) said that gradual decompression was used with success in Holland, but he was in favour of "stages" in suitable cases.

Dr. A. BORNSTEIN (Hamburg) held that decompression by stages gave the best results, that oxygen was very useful in case of accident, and that physical exercise immediately upon leaving a caisson was an important prophylactic.

Professor CATSARAS (Athens) pointed out that the "stages" method was not new, as he himself had utilized it in 1899. He was a strong advocate of this system.

Industrial Poisoning.

The last discussion was on industrial poisoning, the first part dealing with the early diagnosis of lead poisoning.

Dr. T. M. LEGGE gave the results of ten years' notification of lead poisoning in England. He showed that the notified cases had diminished by one-half during this period, but this diminution had been limited to those industries placed under special rules and where periodic medical examinations are compulsory. He pointed out that where such restrictions are not enforced there is a tendency to increase. He explained that fatal cases do not diminish at the same rate as non-fatal cases, this being attributed to the tendency to consider lead as an accelerating cause of death in persons suffering from other diseases, such as chronic nephritis. He considered that nine-tenths of the cases had been due to inhalation of fumes or dust.

Dr. S. KING-ALCOCK (Burslem) discussed the early symptoms of lead poisoning. He was of opinion that the blue line could only be of service as a diagnostic factor when taken in relation to others associated with it. He regarded anaemia as a more trustworthy symptom of poisoning, and that "Pepper's granules" are of no practical use for diagnostic purposes. Headache, when other causes could be eliminated, he considered to be a grave indication of lead poisoning. As regards colic and constipation, though specifically associated with lead, he mentioned that diagnosis of causation was often very difficult.

Sir THOMAS OLIVER described two cases of lead poisoning where diagnosis had proved to be very difficult, and stated his opinion that the examination of blood corpuscles for basophile granules was quite unreliable.

Professor STERNBERG (Wien) mentioned as essential symptoms the presence of lead in urine and faeces, the blue line, the presence of basophile granules, anaemia, peculiar complexion, haematoporphyrinuria, and alimentary glycosuria, and that when none of these exists and the administration of iodide of potassium does not produce lead in urine, one can safely say that there is no lead poisoning.

Dr. BUSCHOLD (Berlin), Dr. MEILLÈRE (Paris), Dr. GOADBY (London), and Professor CRISAFULLI (Bologna) also contributed to this discussion.

Professor GLAISTER (Glasgow) read a paper on industrial poisoning by gases of arsenic and phosphorus. He mentioned different trade processes which had given rise to the occurrence of 120 cases of poisoning by arseniuretted hydrogen, and referred particularly to two fatal cases that he had met with. He described the symptoms and *post-mortem* appearances. He also described two fatal cases of poisoning by phosphuretted hydrogen and some experiments with this gas on animals.

Dr. R. PROSSER WHITE and Dr. A. SELLERS contributed a joint paper on industrial aniline poisoning, describing a fatal case and a number of experiments made at the Manchester Public Health Laboratory with the object of showing that symptoms have been due to inhalation of the fumes of aniline in cases where they are supposed to have been caused by absorption of aniline oil through the skin.

A large number of interesting papers, which had no direct bearing on the subjects for main discussion, were taken on September 14th, among these being a valuable contribution by Dr. T. D. Lister, on Phthisis as a Disease of Occupation.

SCIENCE NOTES.

DIPHTHERIA in fowls is a disease which possesses a peculiar interest. Not unlike human diphtheria in respect of the lesions which it causes in the mouth and the eye, it yet bears a character of its own, for it is distinguished by the extreme chronicity and waywardness of its course. Several organisms have been accounted responsible for its origin, and amongst these the most likely seems to be that isolated and described by Bordet and Fally three years ago. The organism is remarkable for its very small size and the difficulty of getting it to grow on artificial media. It refuses to grow on ordinary and even on most blood media, and under the most favourable circumstances as yet discovered a hardly appreciable growth is the most that is obtained. The difficulty of

getting pure cultures is very considerable. It is impossible to do so from the mouth, and the most successful method hitherto devised is to break up one of the mucous patches in water, dip a sterile thread in this, and pass the thread between the closed eyelids. A comparatively pure culture can be obtained from the conjunctival lesion. The medium used is the same as that employed by Bordet and Gengou in the case of whooping-cough. It contains rabbit's blood, and, curiously enough, gives better results than a similar medium containing hen's blood. Under the highest magnification the microbe appears as little more than a point, although occasionally it assumes the form of tiny rods. It has a tendency to form large clumped masses. Its resisting powers are considerable, and it retains its virulence even after several months' growth on artificial media. For some time after the discovery of this organism there was a doubt as to whether it actually multiplied in the diphtheritic lesions, but the authors are now able to announce that this certainly does occur. Attempts to produce immunity have been made, but the results have not yet been published.

Four or five years ago a Canadian inventor made the suggestion that steamships should be furnished with brakes capable of stopping them instantaneously, even when travelling at full speed. When it is considered that a large proportion of marine disasters are due to the inability to stop a ship in its course, the importance of such an invention will be obvious. From preliminary trials made with small steamships, it would appear that some measure of success may be achieved by such appliances as have been experimented with. They take the form of a kind of shutter constructed of steel plating and mounted on hinges on each side of the vessel. They are placed in such a position that the upper border of the shutter is flush with the water line. When the ship is in motion they lie flat against the hull, but, being controlled by an electrical apparatus, they can be opened instantaneously, so as to project straight out. Both may be opened simultaneously, bringing the vessel to a dead stop, or only one may be opened, in which case the ship is diverted abruptly from its course. Such appliances have recently been installed on the American ironclad, the *Indiana*, and it will be interesting to see of what use they will be in vessels of such size. The most natural thing to expect would be that in the case of such large vessels travelling at full speed the sudden opening of the shutters would cause them to be torn violently off. A series of photographs depicting the new invention is shown in a recent number of *La Nature*.

LITERARY NOTES.

At the Teatro Metastasio of Rome there was recently performed with great success a play called *Novelletta Antica*, of which the author, Dr. Licurgo Tioli, is a member of the medical profession.

The Oxford University Press has obtained no fewer than seven of the Grands Prix awarded by the jurors at the Brussels Exhibition to British exhibitors in the domain of book production. It may be recalled that at the Paris Exhibition three Grands Prix were awarded to the Oxford University Press.

Professor Osler's *Principles and Practice of Medicine* has been translated into Chinese by Dr. P. B. Cousland, President of the China Medical Missionary Association, Shanghai. This undertaking has engaged Dr. Cousland's energies, with frequent interruptions, for several years past. It is the only first-class work on the principles and practice of medicine that has so far been translated into Chinese. The following works are also in course of translation: Heath's *Anatomy*, by Dr. Cochrane of Peking; Stengel's *Pathology*, by Dr. McAll of Hankow; Hutchison and Rainy's *Clinical Methods*, by Dr. Cormack of Peking; Fuchs's *Ophthalmology*, by Dr. Neal of Tsinan. A new and compact *Systematic Anatomy* is passing through the press. An atlas of beautiful anatomical plates has just been printed for the China Medical Missionary Association by the Oxford Press and Messrs. Hodder and Stoughton, at a cost, apart from the letterpress, of £500, part of which has been contributed by the China Emergency Appeal Committee. As dissections of the human body are not yet allowed in China, such plates are of the utmost importance.

There has always been a wide diversity of opinion regarding the precise nature of the disease from which Pascal suffered and the illness of which he eventually died; and for many years the subject has proved a fruitful source of discussion amongst medical men. But although both the physical and mental health of the great mathematician and mystic have received much attention from medical writers, the riddle has not yet been solved with any degree of certainty, and any fresh light thrown upon the matter must always be welcome. In the *Tribune médicale* for August 27th M. Carry has advanced a new theory as to this vexed question. To begin with, he differs entirely from those who maintain that Pascal succumbed either to tuberculosis or neurasthenia, and brushes aside, as unworthy of serious consideration, the theory, founded upon an account given by Pascal's own mother, that all the strange nervous troubles with which he was afflicted throughout his short life were due to the "magic and spells" of an old witch-woman who wished to be revenged upon M. Pascal *père*, and accomplished her desire by injuring the health of his son, then a child of two years old. M. Carry explains his rejection of these theories by his firm belief that they have no foundation in actual fact, and are borne out neither by the symptoms displayed during life nor by the signs of disease found in the body after death. In his opinion, Pascal suffered, and finally died, of lead poisoning, a disease which, though unrecognized, was very frequent at a period when plates made of pewter or glazed with litharge were always used by the middle and lower classes. This opinion is based upon a very striking fact, for M. Carry has actually seen and commented upon a whole series of lead poisoning cases amongst girls who earned their living by winding cotton upon reels, and who were gradually poisoned by the absorption of dust arising from cotton which was dyed yellow by means of chromate of lead. Their symptoms were identical with those of Pascal, and were due, without a doubt, to their dangerous occupation. It seems, therefore, at least probable that Pascal was, during the whole course of his life, undergoing a process of slow poisoning, and that his various digestive troubles, headaches, vertigo, and general state of weakness and languid depression, were due to this cause. His illness in early childhood and his impressionable nervous system would do much to render him peculiarly susceptible to such an infection, and moreover, as M. Carry tells us, a very small quantity of lead will produce symptoms analogous to those of nervous diseases. The paraplegia from which Pascal suffered as a young man might possibly have arisen from the same cause; but what M. Carry regards as conclusive evidence in favour of his own diagnosis is the nature of Pascal's last illness, which presents the salient features of lead poisoning—the terrible *coliques sèches*, lasting for several days, and the final attack of brain disease accompanied by convulsions. The result of the autopsy also bears out the diagnosis of lead poisoning, the gangrenous—that is to say, bloodless—intestines, and the dried shrivelled liver, being due to the colics, and the two central haemorrhagic foci on the surface of the brain to the encephalopathy. These foci, says M. Carry, had been caused long before death by a vascular atheroma, obviously due to the action of lead, since no other disease could have produced it save malaria or syphilis, of which there is no question in this case. "We can therefore believe," says M. Carry, "that Pascal was thus slowly and interruptedly poisoned, the only result at first being intermittent troubles, but later gradual arterial alterations took place, and ultimately an attack of lead colic and a final attack of headache with haemorrhages caused by vascular alteration." The author closes this interesting little article by enumerating the conclusions to which M. Paul Savy has arrived after studying the case of Pascal. From them we gather that the intellect of this famous man cannot have suffered in the least from the cerebral disease, since it has been proved that it commenced only a few days before his death.

THE COMPOSITION OF CERTAIN SECRET REMEDIES.*

MEDICINES FOR RHEUMATISM, GOUT, AND NEURALGIA.

WE have already published, in the BRITISH MEDICAL JOURNAL of October 10th, 1908, a report on the analysis of a number of proprietary preparations advertised for the cure of rheumatism and allied complaints, and bath salts for rheumatism have also been reported on in a separate article in the JOURNAL of February 12th, 1910. There are many others no less widely advertised, some of them having been established many years, and others being of quite recent introduction; we give here the results of the examination of a further selection of such preparations, with some specimens of the claims made for them.

DR. HOFFMAN'S RHEUMATIC POWDERS.

These powders are supplied by 'The International Chemical Co.," 324, Caledonian Road, London, N. They are advertised in the following terms:

Greatest and latest discovery in medicine.
Dr. Hoffman's Celebrated Rheumatic Powders.
Great German Rheumatic Cure.

Will cure permanently all forms of Rheumatism, Gout, Neuralgia, Sciatica, Excess of Uric Acid, etc.

Highly endorsed by the leading Medical Profession, Analytical and Consulting Chemists, and general public in all parts of the world. Contain absolutely no injurious drugs, poison, or any kind of Narcotic. Its manufacture is based on scientific principles.

Relief is felt after the First Dose.

There is nothing known in medicine which will compare with it.

A circular enclosed in the package contained statements similar to the above, accompanied by a so-called "analysis" in the following terms:

I hereby certify that "Dr. Hoffman's Rheumatic Powders" have been tested in these laboratories, the data obtained being of a most satisfactory character, and indicating them to be judicious and skilful preparations that are well suited for the purposes for which they are designed. They are valuable powders for rheumatism, gout, and kindred complaints. These powders are free from narcotics, poisons, or undesirable constituents, but are powerful uric acid solvents. I consider them to be perfectly safe, reliable, and effective medicines.

This recommendation, or testimonial, bears the name of an individual who has made himself conspicuous by giving such puffs under the name of analyses; his name is followed by a long paragraph setting forth his title to speak with authority, commencing with "Ph.D.," and concluding with "Ph.D., etc." but with no mention of the University which conferred this duplicate degree. Such distinctions as "author of . . . 'The Physiology of the Invertebrate,' 'Respiratory Proteids,' etc. . . . Analytical Chemist, Assayer and Chemical Engineer, Consulting Chemist and Expert Adviser to Foreign Governments, Corporations, Collieries, Companies, Pharmaceutical and Chemical Manufacturers; . . . Bacteriological and Agricultural Expert," are no doubt intended to display his ability to pronounce with authority on the merits of powders for rheumatism or on any other subject whatever.

The powders are supplied in boxes at 1s. 1½d. and 2s. 9d. A 1s. 1½d. box was found to contain 12 powders. The directions are:

Take one powder every three or four hours; place on the tongue, and wash it down with a draught of water.

It would appear that the amount taken at one time is not regarded as of great importance, as the powders in one box varied in weight from 11.3 to 20.8 grains, the average of the 12 being 15.8 grains. Analysis showed the powder to have the following composition:

Acetyl-salicylic acid	66.4 per cent.
Phenacetin	11.4 ,,
Caffeine	1.3 ,,
Sugar	20.1 ,,
Moisture	0.8 ,,

Acetyl salicylic acid is also known by the shortened name of the *B.P.* Codex, acetosalic acid, and by the trade names Aspirin, Xaxa, etc. The estimated cost of the materials for 12 powders is 1d.

EADE'S GOUT AND RHEUMATIC PILLS.

These pills are prepared by George Eade, 232, Goswell Road, London, E.C. In an advertisement it is stated that they

instantly relieve and rapidly cure the worst form of gout, rheumatism, rheumatic gout, pains in the head, face, and limbs.

The extracts which follow are from a circular enclosed in the package with the pills:

They are especially recommended to the afflicted, with confidence arising from experience, as one of the valuable results of the improved state of medical science, and the only efficient remedy ever discovered for these disorders.

The never-failing effects of Eade's Gout and Rheumatic Pills in curing these distressingly painful diseases have secured to them a celebrity unequalled by any medicine of past or present times. They not only give relief in a few hours where the patient has been driven to madness by the horrible, excruciating tortures of this disease, but restore to perfect health in an inconceivably short space of time—in most cases giving relief from the intolerable pain in one or two hours; one bottle will frequently carry off the attack in two or three days, even when the patient has kept his bed for as many weeks, and sometimes months.

These Pills have repeatedly succeeded after all the usual internal and external remedies have failed; and it is their peculiar property that the first dose completely arrests the frequent tendency of those diseases to attack some vital part while, if attacked, the symptoms are immediately and effectually removed.

The pills are supplied in bottles at 1s. 1½d. and 2s. 9d.; a 1s. 1½d. bottle was found to contain 18 pills, and a 2s. 9d. bottle 60 pills. The directions are: "Take one Pill three times a day, and two at bedtime; for delicate females and weak persons, one Pill night and morning."

The pills were not coated, as ordinarily understood, but had a thin irregular layer of adherent powder, which proved to be carbonate of magnesia; the average weight of one pill was 5.4 grains. Analysis showed the presence of aloes, powdered colchicum corm, and extractive, with cane sugar, glucose, gum and dextrin, various characters indicating that the sugars were added in the form of treacle; the amount of colchicine was determined (and the alkaloid identified) and was found to be considerably more than would be proper to the amount of corm present, and this fact and the presence of an extract pointed to extract of colchicum being present as well as the corm. The amounts of the different constituents were determined as accurately as possible; the amount of aloes, not being determinable with any exactness, was arrived at by comparing the pills by various tests with a mass of known composition. The formula was found to be as follows:

Barbadoes aloes	10 per cent.
Extract of colchicum	18 ,,
Powdered colchicum corm ...	35 ,,
Treacle	27 ,,
Gum and dextrin	10 ,,

Estimated cost of materials for 18 pills, ¾d.; for 60 pills, 2½d.

URICURA DROPS AND LINIMENT.

These preparations, also known as Hammond's Specifics, are made by the Hammond Remedies Company, Barry, Glamorganshire. An advertisement inquires:

Have you tried to eliminate the cause of Rheumatism, Gout, Lumbago, and Sciatica? Uricura Drops will do this for you, being the finest cure for these complaints.

The price of each is 1s. 1½d. A bottle of the drops contained half a fluid ounce, and of the liniment 4 fluid ounces. On the package of the former appears:

N.B.—In conjunction with the drops it is strongly recommended to use Uricura Liniment.

And on the package of the liniment:

N.B.—It is strongly recommended that for Rheumatism, Lumbago, and Sciatica, Uricura Drops be taken in conjunction with the Liniment.

In a circular enclosed in each package it is stated that:

"Uricura" Liniment and Drops (Hammond's Specifics) Cure

* Previous articles of this series were published in the following issues of the BRITISH MEDICAL JOURNAL: 1904, vol. ii. p. 1585; 1906, vol. ii. pp. 27, 1645; 1907, vol. i. p. 213; vol. ii. pp. 24, 160, 209, 393, 530, 1653; 1908, vol. i. pp. 833, 942, 1375; vol. ii. pp. 86, 505, 1022, 1110, 1193, 1285, 1566, 1697, 1875; 1909, vol. i. pp. 31, 909, 1128; vol. ii. p. 1419; 1910, vol. i. pp. 151, 213, 393, 1005, 1063, 1120.

Rheumatism, Gout, Sciatica, Lumbago and Neuralgia When All other Remedies fail.

These invaluable preparations have permanently cured many bad cases of from One to Twenty Years' standing. They give immediate relief, and effect a Cure quickly if Regularly and Persistently used as directed. . . .

For Colds in the Chest, Sore Throat, and Swollen Glands, nothing better than the Liniment can be used.

Athletes and others will find the Liniment a most efficacious remedy for Sprains, Bruises, Stiffness and Cramp. It has been used with remarkable results by leading Football Players.

Uricura Drops.—The directions are:

Dose.—Four Drops on sugar, night and morning. Increase two drops each day up to 10, and then reduce two drops each day.

Analysis showed the liquid to contain oil of turpentine, terebene, and oil of amber; no other ingredient could be detected. The proportions of the constituents were ascertained as nearly as possible by analytical methods and checked by comparison with made-up mixtures. The approximate formula arrived at was:

Oil of amber	5 per cent.
Terebene	47.5 ,,
Oil of turpentine	47.5 ,,

Estimated cost of ingredients of half a fluid ounce, ½d.

Uricura Liniment.—The directions are:

To be gently rubbed in for 10 to 15 minutes, night and morning.

The liniment consisted of a partly separated emulsion, which was found to contain oil of turpentine, acetic acid, ammonia, alcohol, egg-substance (as emulsifying agent), and water; a trace (under 0.01 per cent.) of alkaloid was found, but this did not possess any properties by which it could be identified, and may have consisted of bases derived from the egg. The acetic acid and ammonia of course combine, but the former was in excess and the liniment moderately acid, that is, about one-fourth of the acetic acid being in the free state. The quantities of the different ingredients were determined (the egg-substance only approximately) and the formula arrived at was as follows:

Oil of turpentine	42 parts	(by measure)
Acetic acid (*B.P.*) ...	10 ,,	,,
Strong solution of ammonia	2.3 ,,	,,
Alcohol	9.0 ,,	,,
Egg-substance	2 0 ,,	,,
Alkaloid (?)	0.01 ,,	,,
Water, to	100 ,,	,,

In estimating the cost of ingredients, the alkaloid is neglected; if the alcohol present were added in the form of rectified spirit, the cost of the ingredients for 4 fluid ounces would be about 1½d.; but if, as is more likely, "non-mineralized methylated spirit" were used, the different odour and other characters would be covered by the other ingredients, and the cost would be about ¾d.

CHAMELEON OIL.

This is made by the Chameleon Oil Company, Limited, 4, Albany Courtyard, Piccadilly, London, W. It is advertised as "The Only Perfect Liniment," but the directions show that it is intended to be taken internally as well as applied externally. Besides being recommended for human patients, it is described as "The Best Veterinary Medicine known."

It is stated on the package that:

Chameleon Oil Relieves and Cures Rheumatism, Sciatica, Lumbago, Neuritis, Neuralgia, Toothache, Headache, Earache, Backache, Colds, Sore Throats, Sprains and Strains, Stiff and Swollen Joints, Chilblains, Chapped Hands, Insect Bites, etc., etc.

A pamphlet enclosed in the package gives further particulars; paragraphs headed "The Story of its Birth" and "Discovery of an Ideal Liniment" do not actually give much information, but the references to the heart of Nature and herbs used by native tribes seem to indicate a method of discovery common to a very large number of nostrums. The following are extracts from these paragraphs:

When a Roman Scholar coined the word "Liniment" which, literally translated, means "to anoint," he had in mind the germ-idea of what a perfect liniment should be. In his day the physician anointed his patient with a healing balm which had the magical effect of curing muscular trouble without the aid of that tiresome modern invention—massage. Such a thing was totally unnecessary with the Romans, who possessed a supreme knowledge of the curative action of simple herbs upon the human frame. . . . But the priceless secret of that painless balm was lost, and so it happens, at the present day, when an embrocation or a liniment is mentioned one instantly conceives of some crude preparation which must be rubbed into the skin violently.

. . . it was left to Dr. Chas. F. Roberts to bring the word back to its original meaning, as being an ointment whose sole method of action would consist of simply anointing the affected part, and thus painlessly effecting the cure. The task he had set himself was to produce an external application which, to the two other virtues of being "soothing and pain-killing" should add a third, and the most important of all, "a healing power." As an advanced medical man he realized that the ideal of the healing art should be to relieve human pain by natural means. And so, like the ancient physician, he went back to the heart of Nature in an endeavour to wrest from it the secret of an ideal liniment. In the course of his searches he was favourably impressed with the healing properties of many herbs used by native tribes, because being a rational person he believed, like the late Rev. Charles Spurgeon, that there was a deal to be gained from the use of "sanctified common-sense," which after all is the sum of a man's own tried and trusted experience. Armed with this knowledge, which he further tested by very careful laboratory research, his industry was at length rewarded in finding a perfect liniment with the treble merit of being "healing, soothing, and pain-killing," the result of which is embodied in Chameleon Oil Liniment.

The action of Chameleon Oil is simplicity itself. Immediately the Liniment has been applied, it sets out upon its message of discovery and healing, travelling with lightning rapidity to the seat of the trouble. This found, it restores to the affected part all that pristine freshness which pain and suffering has caused it to lose, quickens the action of the blood, and renews the patient's vitality. . . . The principle of Chameleon Oil Liniment may be summed up in a few words—it releases those healing powers which nature itself has set in the human body in order to overcome the constant wastage and ravages of disease.

The general directions are:

Shake the bottle thoroughly until the contents become cream coloured. Rub the Oil gently into the affected part (use plenty of the Oil) until the pores of the skin refuse to take any more and sweating begins; then cover with a layer of wool, flannel, or other porous material, and fix with a bandage. FOR STRONGER EFFECT, wash affected part with hot water and apply Oil as above after drying. FOR VERY POWERFUL EFFECT, wash first with very hot water, apply Oil as above after drying, and bandage with flannel or absorbent cotton wool soaked in the Oil or solution of it. Keep on bandage as long as possible; note that if kept on too long it will raise a blister.

Special directions are given for its use in various complaints. The following will serve as a sample:

FOR COUGHS AND COLDS. FOR COLD ON THE CHEST.—Rub the throat, chest, and the back between the shoulder blades thoroughly with the Oil, and while the skin is still moist apply a fold of warm flannel; take 15 to 20 drops of the Oil in a little sweetened water, or gruel, at bedtime. FOR CATARRH OR COLD IN THE HEAD.—Mix one part of the Oil with eight parts of warm water, gargle the throat, inhale the fumes up the nostrils, and a few applications will cure. FOR CONTINUED COLDS.—Rub the chest thoroughly every night with the Oil and cover with a piece of flannel. Take 15 drops of the Oil in a wineglassful of water three times a day between meals.

A 1s. 1½d. bottle which was examined contained 3 fluid ounces, and a 2s. 9d. bottle 9¼ fluid ounces. The liquid in the two bottles differed in composition; it consisted of an oily and an aqueous layer, these being in the ratio of 1 to 1.66 in the one case and 1 to 2 in the other. The figures given below refer to the mean composition of the two.

The oily layer consisted of a mixture of essential oils; this was submitted to fractional distillation, and the following were recognized: Oils of turpentine, camphor, mustard, spearmint, pimento, and cassia (or cinnamon). The aqueous layer contained some alcohol, free ammonia in considerable quantity, and a resin in combination with ammonia as a soluble resinate; some of the resin was extracted and examined, but its characters did not agree with those of any single resin in ordinary use; various mixtures were made and compared with it, but complete agreement in all characters was not arrived at, and it is not possible to speak positively as to the nature of the resins present. By making a mixture of balsam of tolu (4 parts) and storax (1 part), boiling with ammonia, and filtering from the undissolved portion, a solution of ammonium resinates was obtained which agreed fairly well with that present in the chameleon oil.

The amounts of all the other constituents were determined with as much exactness as is possible

with such a mixture, and the following formula was arrived at:

Essential oil of mustard ...	0.75 part by measure
Essential oil of spearmint	0.45 " "
Essential oil of pimento	1.5 parts by measure
Essential oil of cassia ...	1.5 " "
Essential oil of camphor	15.0 " "
Oil of turpentine ...	15.0 " "
Alcohol (90 per cent.) ...	7.3 " "
Strong solution of ammonia	8.0 " "
Resins (as above) ...	1.6 " "
Water, to	100 " "

A mixture prepared by this formula agreed in physical and chemical properties with the original, except in regard to some minor characters of the resins.

Assuming the resins to be of the nature indicated, the estimated cost of the ingredients for 3 fluid ounces is $3\frac{1}{10}$ pence if rectified spirit were used, and about 2½d. if non-mineralized methylated spirit were used.

LEVASCO.

The address given on the package of this article is merely "Levasco Dépôt, Dover"; it is described as "The Great Indian Gout and Rheumatic Cure."

The following extracts are from a pamphlet contained in the package.

Levasco.—This wonderful preparation is the discovery of a Hindu Doctor in the Himalayan Mountains, and if you but give it a trial you will find yourself Quickly freed from pain and anguish.

Levasco is for outward application only, is not an oil, and requires no rubbing, it can be conveniently used at any time. Two or three applications daily Cures the most Chronic cases. . . .

Levasco is not being advertised altogether as a business venture, but partly from extreme gratitude of one who for many years was a great sufferer.

Levasco has an exhilarating effect on every nerve and muscle, similar to a soothing electric current, which diffuses a gentle warmth, goes direct to the pain centres, and gives immediate relief.

Levasco penetrates the skin, breaks up the Uric Acid, causing the blood to flow freely, the pain then ceases.

Levasco will effect a permanent Cure after years of suffering if the directions are followed and persevered with. . . .

Levasco has a pleasant and invigorating odour, the relief is marvellous. Sufferers will sometimes resort to ordinary remedies, and the continual pouring of drugs into an already weakened system will snap the vitality, and cause their lives to become a misery which brings habitual users to an early grave.

Gout cured in a few hours.—Apply Levasco upon the affected parts. . . . The first application will give immediate relief. After a few hours' treatment—during which time Levasco should be applied as often as possible—your Gout will have entirely disappeared.

Levasco applied freely will cure Lumbago or Sciatica in one night.

Neuritis.—Levasco rubbed upon the affected part gives immediate relief, and after three or four applications the pain will be gone, but do not cease using to effect the cure. You must continue to use for a week or two—two or three times daily, or when the pain is felt. This is a most difficult complaint to cure, and some great authorities say it is incurable, but we have evidence where perseverance and regular use of Levasco has effected the cure.

No athlete should be without a bottle of Levasco. A little rubbed on the limbs previous to and after any extra exertion, ensures your fitness for the next event.

Headache Cured in a few minutes.

Earache Cured in 2 minutes.

Toothache Cured in 2 minutes.

Great care should be taken that Levasco is not applied to wounds, cuts, or embrasures (*sic*).

A 1s. 1½d. bottle was found to hold rather less than 1 fluid ounce. Analysis showed the presence of oleo-resin of capsicum, oils of rosemary and lavender, camphor, alcohol, and what appeared to be a trace of soap. The quantities of the different ingredients were determined as exactly as possible, and the results indicated the following formula, and a mixture prepared in accordance with it was practically indistinguishable from the original:

Oleo-resin of capsicum	3 grains.
Camphor	6 "
Oil of lavender	3 minims.
Oil of rosemary	4 "
Soap	½ grain.
Methylated spirit, to	1 fluid ounce.

Estimated cost of ingredients, ½d.

DYXOL.

This preparation is supplied by Dix and Co., Slough. It is stated on the package that:

Dyxol cures Neuralgia, Toothache, Cold in the Head, Headache, Stiff-neck, Lumbago, Rheumatism, etc., etc.

Further particulars are given in a circular enclosed with the bottle, from which the following extracts are taken:

This is a simple Preparation of great value for the removal of all kinds of Pains. Most of these are caused by Congestion of the Blood in certain parts of the body. Relieve this Congestion and you drive away the Pain.

Dyxol has the power, above all other known preparations, of almost instantly dispersing congested blood. Its efficacy in this direction can be easily demonstrated. Rub one drop of Dyxol on the face, when, in less than one minute, the spot will temporarily redden through the flow of blood to the surface.

In another advertisement the following statements occur:

Simply rub on or inhale Dyxol according to directions, and neuralgia vanishes like magic. Muscular Rheumatism is speedily relieved by rubbing in a little Dyxol. Dyxol quickly removes the most obstinate cold in the head and on the chest, and it is an excellent remedy for Headache, Toothache, and Earache. Dyxol inhaled prevents influenza.

A 1s. 1½d. bottle contained 2 fluid drachms. The general directions are:

No rubbing is necessary. Apply one or two drops to the part affected. When using, fan away the vapour which arises. This will prevent discomfort to the eyes. To produce a milder action add a small quantity of Dyxol to an equal quantity of pure Olive Oil.

Analysis showed the principal constituent to be volatile oil of mustard, others being oils of pimento and nutmeg, liquid paraffin (heavy and light), and a fixed oil; the latter appeared to be cottonseed oil, but the quantity was too small for positive identification. The results of quantitative analysis indicated the following formula, and a mixture prepared in accordance with it was practically indistinguishable from the original:

Essential oil of mustard ...	20 per cent. by volume.
Essential oil of nutmeg ...	20 " "
Essential oil of allspice ...	4 " "
Cottonseed oil	6 " "
Liquid paraffin, yellow ...	17 " "
Kerosene	33 " "

Estimated cost of ingredients for ¼ oz., 2d.

POND'S ARTHRITICUS.

This preparation is supplied by G. P. Pond and Son, 68, Fleet Street, London, E.C. It is stated on the label that it

cures Gout, Rheumatism, Rheumatic Gout, Lumbago, Sciatica, and all Rheumatic Affections. . . . It contains no drugs, no colchicum. Arthriticus neutralizes all Gouty and Rheumatic Acidity in the Stomach, Liver and Bowels; removes the offending matter from the System, the Blood is purified, the Liver and Kidneys are relieved, the Joints become supple, and there is a general freedom from pain. The Skin, participating in the improvement, loses any Gouty Eczema which may exist, and assumes a healthy appearance.

A pamphlet enclosed in the package bears the title:

Gout and Goutiness. Their cause, treatment, cure, and prevention. By Geo. P. Pond, M.P.S., Surgeon-Chiropodist. In practice since 1857.

The degree of enlightenment to be obtained from this treatise may be judged from the following extracts:

No food or drink is gouty; yet, no alcoholic drink can be said to be good for gout; that is, anti-gout; it is the quantity and quality which are so. . . .

No one can reasonably deny an instinctive knowledge and a physical power exerted in the stomach by a conscious principle which selects and rejects, and which in its natural purity may be ranked as a nerve of sense. . . .

Air, again, is as necessary with every mouthful, in the process of digestion, as the gastric juice itself; it mixes with the saliva which pours out of four different glands of different kinds and forms a powerful solvent for the food. . . .

Water, like air, is nourishing. . . .

Cold is death, warmth is life. Cold is, perhaps, the greatest cause of disease. . . . Of all supposed remedies to strengthen the body, cold baths in cold weather are the most dangerous.

Several other preparations from the same maker are recommended in the pamphlet.

The price of "Arthriticus" is 2s. 6d. per package; this was found to contain a bottle holding nearly

13 fluid ounces of liquid and 16 powders. The directions are:

One of the Powders to be taken with every dose, mixed thus: In a tumbler pour a wine-glassful of water, mix with it a sixteenth part of the Arthritions, then add one of the Powders and drink immediately, while effervescing.

It is ordered to be taken night and morning for gravel and affections of the kidneys and bladder, and all abnormal conditions of the urine; twice or thrice daily for rheumatism, sciatica, lumbago, etc.; and similarly in other cases.

The powders varied in weight from 10.9 grains to 17.4 grains, the average being 14.2 grains; they consisted of tartaric acid. Analysis showed the mixture to have the following composition:

		In one dose, approximately.
Lithium citrate	1.4 parts,	5.0 grains
Potassium citrate	0.9 part,	3.0 ,,
Sodium citrate	0.2 ,,	0.7 grain
Sodium salicylate	1.5 parts,	5.3 grains
Potassium bromide ...	1.6 ,,	5.6 ,,
Potassium bicarbonate ...	8.0 ,,	28.0 ,,
Glycerine	5.1 ,,	18.0 ,,
Chloroform water, about ...	10 ,,	by measure
Water, to	100 ,,	,,

On mixing a dose of the liquid with one powder, the resulting draught would be alkaline even with the heaviest powder; the alkalinity would of course be greater when the lighter powders were used.

Estimated cost of ingredients for mixture and powders, 2½d.

Magic Foot Drafts.

This is the name by which plasters, to be applied to the soles of the feet for the cure of rheumatism, are supplied by the Magic Foot Draft Co., Bangor House, Shoe Lane, London, E.C., the price being 4s. 6d. per pair. In addition to the numerous advertisements of the article by name, others have appeared recently, offering in the name of R. A. Oliver, Bangor House, Shoe Lane, London, E.C., to send "my Celebrated External Treatment [for Rheumatism] ... to try free" to any one sending his name and address. On sending a name and address, a pair of the "Foot Drafts" was received (differing from those sold in the ordinary way by bearing no revenue stamp), together with a long letter and a printed sheet of testimonials; the letter states:

the Drafts cannot be purchased for less than 4s. 6d. per pair anywhere, and you can see that we could not afford to send them on approval if they did not really cure.

To introduce our great discovery most favourably to you, and through you to your friends, we are going to make this extraordinary inducement: Give this pair of Drafts a careful trial; if the results give you faith in our wonderful absorption method, as they must, we shall be pleased to send you three more pairs of our Foot Drafts on receipt of 11s., and as we make no charge for the first pair to all those who accept this offer, this will make four pairs (18s. worth) of Magic Foot Drafts for only 11s. ... We have found by careful study of this disease, based on years of experience, that this number of Drafts will effect a cure in nine out of ten patients, because it nearly always takes all the power of the first two pairs to open up the clogged pores and start the removal of the poisonous acid urates. It is the third and fourth pair that invariably bring that sense of relief and freedom from pain that every poor sufferer is looking for.

This was followed at short intervals by other letters pressing for money to be sent. In the second it is stated:

We take a sincere interest in your case [no case had been even mentioned in sending for the "cure"], and we are going to cure you. Now that the cure has been started, every day's delay makes it more difficult for the Drafts to do their work and we trust that we shall hear from you by return post.

From the third letter:

We prefer to think that the promise you made us two weeks ago has escaped your memory.

[Of course no sort of promise had been made.]

From the fourth;

We think that we are justified in asking to hear from you, for we have spent some considerable time and money in your case; frankly, because we were interested in it. ... According to our terms, which you accepted when writing for the first pair of Drafts, we must have by return either 4s. 6d. (for which another pair of drafts will be sent) or your statement on honor that you received no benefit. ... We guarantee to cure you.

The letters quoted freely from alleged testimonials, and further printed sheets of these were also sent. On one of these is printed in large capitals: "We guarantee Magic Foot Drafts to cure any case of rheumatism!"

Curious discrepancies are shown by some of the testimonials. Thus in the advertisement, referred to above, in which the name "Foot Drafts" is carefully avoided, we read:

A marvellous cure has been effected in the case of Mr. James Bodman, 8, The Mount, Frome. Mr. Bodman writes: "I have suffered from Rheumatism for the past seven years, and was almost a helpless wreck. I tried all sorts of remedies and doctors, but to no avail, and was sinking fast when I tried your treatment. I am glad to say that it has cured all my sufferings, and I have had no aches or pains since. I may add that I am 72 years old, and feel as supple in my joints as a young man.

The following is printed on one of the sheets mentioned above:

8, The Mount, Frome.
1st Feb./09.

The Magic Foot Draft Co.,
Shoe Lane, E.C.

Dear Sir,—I received your letter of recent date, and am pleased to give you the following account of my case of Rheumatism. I have suffered from this complaint for the past seven years, and was almost a helpless wreck. I could neither dress nor undress without help. I could get no rest in bed or up, and my life was a perfect misery. I tried all sorts of remedies, too numerous to mention, which did not give me the least comfort. I also saw a doctor, who stated that he could not cure me. He, however, gave me something to relieve the pain for a couple of nights, but then I became even worse than before. At last I gave up all hopes of ever getting better, in fact, I felt I was fast sinking, until a kind friend called to enquire after me. She said it grieved her to see me walk about such a pitiful sight, and asked if I would try Magic Foot Drafts, as she had received such good results from them. I consented, and she wrote to you for me. I only used three pairs, which cured me of all my sufferings, and I have had no aches or pains or any other complaint since. I may add that I am in my 72nd year, and feel as lissom in all my joints as a young man. I cannot estimate the value of your Magic Foot Drafts to sufferers from Rheumatism. I have highly recommended them to several sufferers since my cure. I scarcely ever go out without some one asking me how I got so well. It makes me feel almost like an agent of the Magic Foot Draft Co. Please send me another of your books, so that I may bring your treatment more directly before my friends and acquaintances. Again thanking you,

I remain, yours faithfully,
James Bodman.

Yet again, in one of the letters from the Magic Foot Draft Co., already quoted from, dated "June 2nd/10," it is stated that:

Mr. James Bodman of 8, the Mount, Frome, Somerset, has just written us regarding the result of three pairs of Drafts. "I have suffered from Rheumatism for the past seven years and was almost a hopeless wreck, as I could not rest in bed nor when I was up, so that my life was a perfect misery. I tried various remedies and also saw a doctor who, while he could not cure me, gave me something to relieve the pain for a couple of nights, but I became worse after this. I had given up all hope when a friend who called to see me, stated that she had received wonderful results from Magic Foot Drafts, and asked for permission to send for a pair for me. I am now delighted to tell you that after wearing three pairs of Drafts, I have not an ache or pain and I am completely cured of all my sufferings. I am in my 72nd year and I feel as supple now in all my joints as a young man. I cannot estimate the value of your Magic Foot Drafts and I can never thank you enough for the benefit they have given me."

This had been "just received" on June 2nd, 1910. The phraseology has not changed much in the interval of sixteen months; but as the gentleman is still in his 72nd year, evidently time stands still with him; curiously, though, in the letter first quoted, which appeared in a newspaper advertisement on May 18th, he is already 72 years old.

One wonders how Mr. Bodman was induced to send three variants of his letter, one of them obligingly omitting any reference to Foot Drafts by name and substituting "your treatment."

The same differences are shown in other letters; in one place is a letter over the name J. W. Ludell, ascribing two cures to Magic Foot Drafts, while in the advertisement in which the latter name is not used he is represented as saying that one cure was due to "your Antiseptic Plasters" and the other to "your treatment"; two variants are given in different

places of a letter from Mr. J. Bull, in one of which he says: "I am thankful to think I tried the Foot Drafts, for they are worth double what you charge for them," and in the other: "I am thankful that I tried your Foot Drafts, for they are worth a good many times the money that I paid."

A booklet which is also sent, entitled "Rheumatism, Its Cause and Cure," contains various plain and coloured pictures professing to represent nerves, arteries, etc., of the leg and foot, and gives an account of how the "Drafts" are supposed to act; the following extract will suffice:

The rheumatic sufferer faces this situation:—His or her system has become more or less clogged with rheumatic poisons—lithic acid, uric acid, lactic acid, or any other toxin, as the case may be. This poison may be either driven out or drawn out. Certain agents—salicylic acid, for example—will sometimes accomplish the former result; but the system will then contain a poison worse than the rheumatism. In fact, remedies which are strong enough to be effective against rheumatism almost invariably ruin the digestive organs. Magic Foot Drafts, as the name implies, draws the poisons out through the pores of the tender skin on the bottom of the feet. The Drafts absorb this poison. A pair should be worn only six days, as they become filled with the waste matter from the body and need renewing in that length of time, if the case is a bad one. . . . Physicians are already using them in their regular practice, and recommending them.

The "drafts" consisted of plasters spread on a sort of jaconet backing, of oblong shape and measuring about 5 in. by 3¼ in.; the darker central portion measured about 3¾ in. by 2¼ in. The margin was coated with about 10 grains of sticky material, which had the physical and chemical characters of "Venice turpentine"; the darker portion, or the plaster itself, weighed about 80 grains, and was found to be a mixture of Stockholm tar and the powdered rhizome of white hellebore (*Veratrum album*); determination of their proportions showed the formula to be, approximately:

Powdered white hellebore	40 per cent.
Stockholm tar	60 ,,

No other ingredients could be detected.
Estimated cost of ingredients for one pair, ½d.

Celmo.

This preparation is supplied by the Celmo Company, 1, Carlton Street, Regent Street, Waterloo Place, London, S.W. It is in the form of tablets, of which a 2s. 9d. bottle contained thirty-six. In a booklet contained in the package the tablets are described as:

Specific for all uric acid ailments, viz.: Gout, Rheumatism, Rheumatic Gout, Lumbago, Gouty Dyspepsia, Sciatica, Eczema, Neuritis, Gouty Eczema, Suppressed Gout, etc.

Other extracts are:

In order to effect a cure the first requisite is to remove the cause. This can only be accomplished by administering a remedy which has the power of dissolving uric acid, and which will also restore the normal alkalinity of the blood so as to prevent fresh depositions. This remedy we present in "Celmo" Tablets. It is the One remedy that achieves a complete and permanent cure, and is the only medicine in the world that has a direct and combined action on the Kidneys, Liver, Stomach, Bladder, Bowels, and Digestive Organs. . . .

We find, in the large majority of cases, from five to eight bottles, 4s. 6d. size, sufficient. The tablets must be taken with absolute regularity, and there should be no interval whatever between the bottles. It is always advisable to state your ailment and order of us direct. We then can change the dose as and when required to expedite a cure.

A so-called "analysis" is published, which is as follows:

I have made a careful Chemical examination of the above-described sample of Compressed Tablets known as "Celmo," and from my results I am able to certify that they are absolutely free from Arsenic, Mercury, Opium, Digitalis, and Colchicum.

I find that these tablets have been prepared from pure drugs of the best possible quality, and contain nothing of an injurious nature whatsoever. The formula from which they are made has been submitted to me, and I am of opinion that it is an excellent one in every way, and one which is not capable of improvement.

After reading in the booklet quoted from that Celmo is "the One remedy," and "the only medicine in the world that," etc., it is somewhat surprising to read, in another circular also enclosed in the package, that:

Every intelligent person is aware it is impossible to prepare any one medicine for Rheumatism, Gout, etc., to suit every system. We overcome this difficulty by supplying "Celmo" Tablets in two forms, both for Uric Acid ailments.

It further appears that there is also a "Celmo No. 2" for indigestion, etc., "Celmo Laxative," "Celmo Ointment," and "Celmo Liniment."

The directions are:

In commencing treatment, take two tablets with half an ordinary glass of water just before or after each of the three meals, making six tablets per day. In very severe cases three tablets can be taken at a dose until pain is relieved, then two as above. A child's dose, one-half to one tablet at times stated.

The tablets had an average weight of 5½ grains. They had a slight smell of oil of juniper, but the amount present was far too small to be determined, and can only be described as a trace. Analysis showed the presence of acetyl-salicylic acid (commonly known as aspirin), powdered charcoal, maltose, glucose, and dextrin (these three being evidently present as malt extract, used for binding the powders together), magnesium silicate, alkaloid, extractive, and the mineral constituents commonly found in vegetable extracts; a slight trace of a pungent substance resembling capsicum oleo-resin was also present. Ordinary talc is magnesium silicate, but the mineral of that composition here present did not have the physical properties of ordinary talc; it is, of course, quite inert, talc being commonly added to tablets as a lubricant to facilitate their production by a machine. The alkaloid and extractive did not show any characters by which they could be certainly identified; the alkaloid did not agree, in its behaviour to various tests, with any of the alkaloids in ordinary medicinal use.

The proportions of the various constituents were determined as accurately as practicable, and indicated the following formula:

Acetyl-salicylic acid	35.5 per cent.
Powdered charcoal, about ...	8.0 ,,
Malt extract, dry	18.0 ,,
Magnesium silicate	14.5 ,,
Other mineral constituents ...	2.8 ,,
Water	12.3 ,,
Alkaloid	0.5 ,,
Extractive, about	8.0 ,,
Oleo-resin of capsicum	trace.
Oil of juniper	,,

Dr. Bengué's Balsam.

This preparation, made by Dr. Bengué and Co., Paris, and 91, Great Titchfield Street, London, W., differs from most of those dealt with here in the important respect that the principal constituents are stated on the label. It is, however, rightly included in this series, since it is advertised to the lay public as

"A Wonderful Remedy for Rheumatism, Gout, Neuralgia."

In a circular enclosed in the package it is stated that:

The following is an enumeration of the different diseases in which Dr. Bengué's Balsam has proved to be the most effective scientific remedy.

Acute or Chronic Rheumatism; Gout; Various forms of Neuralgia; Facial, Intercostal, Lumbar, Ovarian, Sciatical; Locomotor Ataxy; Various forms of Hyperaesthesia; Saturnine Colics; Nephritic Colics; Peritonitis; Gastralgia; Torticollis; Zona.	Spread the Balsam on the affected part and cover up carefully with cotton wool. After two or three applications the parts affected should be cleansed with warm water so as to facilitate the absorption of the Balsam when the next dressing of the Balsam is applied.

The "Balsam" is supplied in collapsible tubes; a 2s. package contained 1½ oz. On the label, following the

name, are the words "Menthol, Methyl-Salicylate, Lanolin," and these three substances were found to be present. Analysis showed the composition to be:

Menthol	18	per cent.
Methyl salicylate	20	,,
Lanoline, anhydrous	54	,,
A fat, apparently lard	8	,,

Estimated cost of ingredients, 1½d.

BOX'S PILLS AND GOLDEN FIRE.

These preparations are supplied by W. H. Box, 161, King Street, Plymouth. The "Golden Fire" is more especially recommended for rheumatism, but it is stated that "in severe cases of Rheumatism, etc., Box's Pills should be taken in conjunction with the 'Golden Fire,'" and the two are associated in many of the statements made. The following specimen extracts are from circulars enclosed in the packages, and other advertisements:

Box's Golden Fire is a New Discovery for the removal of diseases, being an Electric Fluid of Intense Power in rapidly attenuating, dissolving, and removing obstructions in any part of the system.

Box's Golden Fire, which is used internally and externally, is a subtle extract from the vegetable kingdom, the hidden fire or life of plants and flowers, the "Quint-essence of Life!" Call it, if you please, "Bottled Fire!" "Bottled Health!" "Bottled Life!"

This Great Remedy and its accompaniment are sure cures for rheumatism, diphtheria, etc.

In some advertisements the medicines are described as "The Giant Remedy," and it is explained that

The Giants have declared war against unbelief, and are determined to push the battle to the gate. The Giants ask for no quarter nor will they show any, therefore one of the contending parties must be wiped out. The Giants in fight are a noble race and are of ancient origin. Their fathers lived in Eden, and their seed, rising upon the wings of the wind, ultimately spread over the whole earth.

They have lived since the days of creation in the fields, without a covering, sipping the dew and drinking in the sunshine and the rain. When in their prime they were translated to 161, King Street, Plymouth, where they sleep. And when the proprietor of the Giant Remedy calls them they awake, and, springing upon the foe, they quickly overwhelm and annihilate him, and joyfully hand back the captive to his friends in perfect health. Their origin is Divine. As you now see them so they came from the hands of their Creator, filled with the nectar of health and life from root to leaf.

In a circular dealing more especially with the pills directions are given for their use for costiveness, bad taste in the mouth, heart disease, corpulency, sick headache, wind and swelling after meals, toothache, influenza, inflammation of brain, stomach, bowels, lungs, kidneys, etc., fevers, sore throats, diphtheria, and tumours. One of the "testimonials" is headed, in large letters, "Cancer Cured." The full directions in the case of influenza will serve as a sample:

Take as directed on the label. Also make a strong tea of Elder Blossom and Peppermint Herb, and drink a pint at bedtime. Repeat the tea at bedtime for two or three nights, if necessary. It seldom requires repeating. This will save when on the brink of death.

The thrilling nature of some of the testimonials may be judged by an extract:

My brother-in-law had his leg jammed in South Africa between rocks, just above the ankle. He came home, and feared he would be a cripple for life. I advised him to get your Pills and "Golden Fire," which he did, and after 6 days a spot came out under the heel as Black As Your Hat. He has since left for America Quite Cured.

Another circular states:

As certain medical men have done their best by tongue and pen to persuade the public that Box's Golden Fire is poisonous, the said Golden Fire in consequence has been submitted to a rigid Chemical Analysis. The following Report from the Eminent Analyst will effectually sew up the lying lips.

Then follows the report, which is in the usual style of such "analyses," and states that the "Golden Fire" was found to consist of "certain carefully selected and powerful, but perfectly innocent, ingredients, which combined (as in the mixture) may be taken internally or applied externally without fear or hesitation."

The circular continues:

Those who raise the cry of "Poison" are wholesale traffickers in the same—it is their stock-in-trade: Poisons bring grist to their mills, while the poor victims who swallow them perish by thousands.

The directions for use are:

For Rheumatism, Lumbago, Gout, Neuralgia, Sprains, Chest Affections, Asthma, Bronchitis, Swellings, Tumours, Enlarged Joints, etc., the Golden Fire should be rubbed in briskly three or four times a day; and in extreme cases a piece of flannel should be saturated with the Golden Fire and applied after each application.

For Sore Throat, Quinsy, and Diphtheria, rub in several times a day; and to one tablespoonful of Golden Fire add one tablespoonful of water and gargle every two hours.

For the above, Golden Fire should be taken internally three times a day, in a little water, beginning with six drops and increasing a few drops each dose until a teaspoonful is reached, and continue until well.

For toothache, apply Golden Fire to the Tooth and rub it well into the gums. For Neuralgia, Bruises, Sprains, etc., rub it briskly over the seat of pain. For Polypus, apply with a camel-hair brush, and rub in on the outside twice a day.

A 1s. 1½d. bottle of the "Golden Fire" contained nearly 2½ fluid ounces of liquid. Analysis showed this to contain acetic acid, sodium chloride, volatile oils, a little alcohol, starch, dextrin, extractive, and the pungent principle of capsicum. The mixture of essential oils appeared to consist of oils of camphor, eucalyptus, rosemary, and amber. After determining the quantities of the other ingredients, the amount left to be described as starch, dextrin, and extractive was about 7 per cent. of the liquid; this part possessed no characters by which its source could be determined, but the liquid contained solid particles which appeared to be due to defective straining, and microscopical examination of these showed them unmistakably to consist of barley, lobelia, and capsicum, and the liquid appears, therefore, to be a decoction of these, with the addition of the other ingredients named. The pungency was just similar to that of an aqueous decoction of capsicum; the proportions of barley and lobelia could not be determined; the amounts of the other substances found are given in the following formula:

Oil of amber	0.16	per cent.
Oil of rosemary	0.16	,,
Oil of eucalyptus	0.32	,,
Oil of camphor (essential) ...	1.3	,,
Sodium chloride...	6.4	,,
Glacial acetic acid	6 4	,,
Alcohol	1.0	,,
Decoction of capsicum.		
Barley.		
Lobelia.		

It is hardly necessary to point out that lobelia is a dangerous drug to be administered and taken by ignorant people.

A 1s. 1½d. box of the pills contained fifty-three of various sizes and shapes, roughly coated with talc, and having an average weight of 2½ grains each. The directions on the label are, "Dose—Two pills morning and evening, after meals." Analysis showed the presence of powdered capsicum in considerable quantity, this drug forming, in fact, so large a proportion of the pill, that the recognition of other ingredients was a difficult matter; microscopic examination showed also powdered gentian, and a flour which did not agree perfectly in character with any ordinary flour, though having a considerable resemblance to barley flour; small quantities of soap and aloes appeared to be present, and a trace of an essential oil or other aromatic substance which was not identified. The following formula gave a pill substantially agreeing in characters with the pill under examination:

Powdered capsicum	35	parts.
Powdered gentian	15	,,
Flour	15	,,
Aloes	20	,,
Soap	5	,,
Water...	to 100	,,

British Medical Journal.

SATURDAY, OCTOBER 1st, 1910.

METROPOLITAN ASYLUMS BOARD REPORT.

The signs of the times seem to point towards a determined attempt in the near future to break up the Poor Law, and possibly it will not be long before boards of guardians become, like the parish beadle, merely a bygone incident in the social history of England. On the other hand, it is not unlikely that after a passing acquaintance with the melting pot, these boards will continue to flourish until, with the advent of the millennium of social reform, both the poor and their guardians alike disappear into the limbo of forgotten things.

Meantime, neither detractors nor admirers can well afford to forget that on the credit side of the account of Poor Law guardians lies the work of the Metropolitan Asylums Board. It covers a very wide field and is done on thoroughly business-like lines. The Board's latest annual report, for instance, shows that, despite an increase in the average daily number of persons maintained in its institutions, the total expenditure was reduced last year by between forty and fifty thousand pounds. From end to end the volume positively bristles with statistical matter of more or less medical interest, double or treble page tables abounding; but, on the whole, the most attractive part for medical readers lies in the supplement, edited for the Board by Drs. E. W. Goodall and F. M. Turner.

In addition to sundry papers, it provides an account of the united diphtheria experience at all the Board's hospitals during the year 1909, in the shape of a number of tables. They are, indeed, so numerous that a hurried glance at them might easily leave an impression that the antitoxin results were disappointing. It is seen, for instance, that among 453 cases not treated with antitoxin the death-rate was only 4.2 per cent., while out of 4,215 cases submitted to antitoxin the death-rate was 9.7 per cent., or over double the non-antitoxin figure. Similarly, among 299 cases of post-scarlatinal diphtheria, there were 4 deaths among 262 cases treated with antitoxin, and no deaths among 37 cases not so treated. It is only by due attention to the footnotes and by study of the tables relating to laryngeal cases and those in which operations were performed that the truth is discovered. It is these that offer the least questionable test of the gravity of attacks of diphtheria and of the value of any method of treatment adopted, and the impression which the tables relating to them leave is of a very different order to that just indicated as initially possible.

Of such laryngeal cases there were 910, and, while the death-rate among the cases treated with antitoxin was only 15.6, the death-rate among cases not so treated was very nearly cent. per cent.—in precise terms, 99.3 per cent.

Similarly, when the cases in which tracheotomy, or intubation, or both, had to be performed are taken separately, it is found that in cases in which antitoxin was not used the death-rate was cent. per cent., while the rate in the antitoxin series was only 33 per cent.

The foregoing figures relate only to the one year, and should be read in connexion with the charts supplied in the report of the Statistical Committee of the Board. These summarize the Board's experience during twenty years, or the mortality-rates from diphtheria for the four years before and the sixteen years subsequent to the introduction of antitoxin treatment.

The average mortality from all forms of diphtheria for the four years (1890–3) immediately before the introduction of antitoxin was 30.4 per cent.; it has dropped so steadily and continuously that for the last seven years it has never been as high as 11, and is now—that is, at the end of 1909—as low as 9.2.

The same tale is told by the laryngeal cases; in 1894, when antitoxin had begun to be used occasionally, the mortality was 62 per cent. This was a sufficient improvement on previous experience to encourage the use of antitoxin, and in the following two years, when such treatment became general, there was a rapid fall to about half the previous figure. This fall has since continued, so that the figure now stands even for laryngeal cases as low as 15.6.

Nor is the chart relating to operation cases any less striking. In the four years previous to the introduction of antitoxin the death-rate in these cases averaged 66 per cent., and in the year in which it was first used tentatively was as high as 70.5 per cent. As soon as antitoxin began to be used regularly there was a rapid fall, and now for the past ten or twelve years the mortality figure in these, the gravest of all cases of diphtheria, has been in the neighbourhood of 30 per cent., and below it in four out of the last seven years. The precise figure now is 30.7.

When the period covered by these charts is borne in mind, and it is remembered that the figures relate not to the work of one man but to that of a number of institutions, it is difficult to conceive how any person who studies them with a desire to learn the truth can fail to come to the conclusion that the introduction of diphtheria antitoxin must have been of incalculable benefit to mankind.

The other contents of this medical supplement are also of interest. Thus the subject of return cases is dealt with by Dr. Turner on the experience of the South-Eastern Hospital since the date of its reopening in July, 1906, a period of three and a half years. During this time the return-case rate has shown a slight fall in respect of scarlet fever, while the diphtheria return-case rate has remained stationary. Throughout this period the scarlet-fever cases have been discharged quite irrespective of the amount of desquamation of the legs and feet, and the routine employment of a bacteriological examination of swabs from the throats of diphtheria patients has been omitted. The results are considered to show that the precautions which used to be taken in these respects were unnecessary. The advice given to parents has been that for three weeks after their return from hospital the patients should not sleep in the same bed, nor, if possible, in the same room, as children who have not had scarlet fever; that the articles used should be kept distinct, and that the patients should not attend school. Dr. Turner considers that the chief effect of these precautions, in conjunction with the abolition of a bath on discharge, has been to postpone the occurrence of return cases.

A sidelight is also thrown on the treatment of scarlet fever advocated by Dr. Milne at the recent annual meeting. It was tried for a considerable period in two wards set aside for the purpose, but return cases occurred.

There are two papers on Vincent's angina, in the first of which Dr. J. D. Rolleston makes out a very strong case for regarding this particular form of throat affection as a separate entity. It is characterized, he says, by deep ulceration of the tonsil and adjacent structures, usually unilateral, a peculiar fetor, and enlargement of the corresponding lymph glands; etiologically it is associated with the symbiosis of two organisms, a fusiform bacillus and the spirillum described by Vincent in 1896. Among the patients treated during the three years ending with 1907 the number of cases diagnosed as Vincent's angina numbered 95; but these figures, the writer considers, probably underestimate the frequency of the disease. The other paper on the subject is by Dr. Goodall, who is not disposed to regard this affection as a distinct disease.

Dr. Goodall also deals with 35 cases of a fatal variety of ulcerative sore throat, which seem to him to constitute a distinct clinical group. They occurred chiefly during the years 1906 and 1909, and presented considerable difficulties in diagnosis. Most of them were sent to hospital as cases of diphtheria, but in Dr. Goodall's opinion they were really scarlet fever.

When the diagnosis of infectious diseases connected with the throat presents so much difficulty even to experts, it is not surprising that general practitioners should occasionally make mistakes. The details given on this point indicate, however, that it is in connexion with cases of enteric fever that errors of diagnosis most frequently occur; on the whole, this is not remarkable, considering the social class which supplies most of the patients in the institutions of the Metropolitan Asylums Board.

These number, it may be noted, fifteen hospitals and bacteriological establishments for infectious diseases, four asylums for imbeciles, including an infirmary for aged patients, a training school, and an industrial colony for Poor Law children, one ringworm school, two ophthalmia schools, one infirmary, three seaside homes, seven homes and working colonies for the mentally deficient, one training ship and three homes for juvenile offenders. A large number of ambulance stations are also maintained. Of the seventy-three members of the Board, fifty-five are elected by the various boards of guardians in the metropolis and the rest nominated by the Local Government Board. It does its work through committees, and does it so well that we are disposed to think that its existence will form a serious stumbling-block in the way of those who desire not to amend but to end all Poor Law institutions.

THE DOCTOR AND THE PUBLIC

In an article entitled "The Widening Sphere of Medicine," but which might as appropriately have been entitled "The Doctor and the Public," read last year as the Shattuck Lecture before the Massachusetts Medical Society, and now printed by the Department of Neurology of Harvard University,[1] Dr. E. W. Taylor of Boston indicates and attempts to estimate the significance of various well-defined tendencies in present-day medicine. Dr. Taylor was led to this subject by a consideration of the rapidly widening scope of medical theory and practice, with its new and unique opportunities, and the apparent disinclination on the part of many men of promise and varied attainments to take up medicine as a career. What, however, must strike every reader of Dr. Taylor's wise and scholarly address is not so much the natural extension and development of the scope and attainments of medical science, extraordinary though these have been, nor the avoidance of medicine as a career by men of outstanding ability—an economic problem possibly more felt in America than here—but the manner in which the writer discerns the new conceptions and ideals which have accompanied the development of medical science, lays bare the significance of certain economic adjustments, and, as if from some point of vantage, scans the signs of the times and foretells the dawn of a new era in the aims and practice of medicine.

Archbishop Trench said that a man might fairly be assumed to remember clearly and well for sixty years back, and that only five of these sixties would carry us back to the age of Spenser, and not more than eight to the time of Chaucer and Wiclif. In that time the English language has become metamorphosed; yet any one of the imagined series of eight men, Dr. Trench said, would have denied that there had been in his lifetime any change worth mentioning. It cannot be said that the statement holds good for medicine. The changes in a single lifetime have been so great, the innovations—anaesthesia, antisepsis, bacteriology, and in the minute anatomy of the body, to name only a few—so startling, that new sciences have sprung into being and the medical man of to-day speaks a different language even from his immediate predecessor. These changes strike everybody, but changes—perhaps more revolutionary, though less noticeable—are now in process, and they concern the relations subsisting between the medical man and the public. It is to this altered phase that Dr. Taylor draws attention, and it is to meet the altered conditions that he desiderates corresponding adaptations in the teaching faculties.

One of the first of these changes to which Dr. Taylor alludes is the absence of secrecy. From time immemorial medicine has been a secret art. Even a generation ago the apprentice was bound by agreement "not to reveal or to divulge any of his master's secrets *or the secrets of his profession*"; to-day the medical practitioner, in his relations with a private patient, frequently explains not only the nature of the case, but the *rationale* of the treatment, with the hope of securing the patient's willing co-operation. What Dr. Taylor calls this gradual removal of mystery has had far-reaching effects. The doctor's mere dictum no longer carries weight; "his Latin prescriptions, if he still writes them, are doubtfully scrutinized, and the patient more and more demands to know what he is taking and why; he readily seeks other advice outside the profession if the expected benefit does not result from the treatment prescribed. . . . The doctor of the present day shares the practice of medicine as never before with persons wholly without or with inadequate medical training." As a consequence of this changed relation, Dr. Taylor says that the profession stands at a parting of the ways, and he asks, "Will it proceed, fenced in by conventionality and the

[1] The Widening Sphere of Medicine. The Shattuck Lecture before the Massachusetts Medical Society, June, 1909. By E. W. Taylor, M.D. Boston. Department of Neurology, Harvard Medical School. vol. iv, 1910.

traditions of the past, or will it respond to the insistent demands of the times and widen its sphere of activity?"

As a natural extension of this "letting in of the light," the public has become increasingly interested in medical affairs. Public lectures are given, and magazine articles for popular reading are printed, on the greatest variety of medical topics. Concerning these Dr. Taylor says that it is a striking sign of a changed attitude that not many years ago any popular exposition of medicine by a physician was looked upon as a doubtful procedure, indicative of personal self-interest. This narrow state of mind, he says, is happily past, and he looks for the development of a useful, if small, number of physicians who have the capacity and inclination to widen the scope of medicine by these means.

The entering wedge of this movement, however, Dr. Taylor considers to have been the campaign against tuberculosis. He quotes Professor Osler as having said that tuberculosis was no longer a medical, but a social, problem. A recent tuberculosis exhibition in New York had an attendance of 750,000 people, and these figures have been approached in many smaller cities throughout the United States. In this campaign against tuberculosis the profession has enlisted not only the sympathy and practical support of the public, but its active co operation.

In America, Dr. Taylor cites also the development of "Social Service" as one of the most significant features of the widening of medical activity. Beginning some years ago in the Massachusetts General Hospital, and since adopted at a number of institutions in Boston, departments have been formed for the purpose of studying the underlying causes of disease and the social problems connected therewith, through the agency of trained workers under medical direction. The abandoning of secrecy, the shifting of medicine from an empiric basis to one founded on scientific conclusions drawn from data accessible to every one, and the enlistment of the public in many medical activities is making the profession less and less a closed body of experts who, to quote a letter which appeared in the JOURNAL of August 20th, "practise medicine as between man and man, accepting individual responsibility and accepting individual reward," and more and more an organized department of public and social service, with ramifications extending in every direction.

This change is naturally not without its attendant disadvantages. The response to the public demand for information has not always been wise either in matter or form; the writers of popular treatises have too often provided empty dogma in place of proved fact; the susceptibility of the public mind to the potent influences of suggestion has at times been overlooked, and in one important department, that of psychotherapy, the public has been left largely to its own devices, to become the victims of Christian Scientists and other dabblers in the occult, or, occasionally, the sacrificial offerings of well-intentioned but misguided clergymen.

A field grows at its fringes, and it is here that the weeds abound. As a recent correspondence in our columns will show, the sphere of "spiritual" or "mental" healing is at times, and quite erroneously, supposed to be a kind of "no man's land." Such a designation cannot be too strongly rebutted. What usually passes under the name of "spiritual healing" is at bottom—unless it be miraculous—nothing other than treatment by suggestion, a department appertaining solely to medicine, and one to be undertaken by no one unless specially conversant with psycho-analytic and psycho-therapeutic methods. Surely the clergyman who undertakes the spiritual healing of diseases—such as, for example, myasthenia gravis—does not realize the loss he and his patients suffer by his exchanging his honourable calling for another in which he has no proper training. Doubtless, as Dr. William Salmon says in his *Ars Chirurgica* (London, 1698), there have always been those who, "Whatever their Qualifications were before, whether a Preacher, a Reader of Prayers . . . or a Bellows-blower, or Nothing at all, it matters not much, for at once, in the twinkling of an Eye, as it were, after a Miraculous manner, they can mount from the profundity of Ignorance to the Pinnacles of Knowledge; from the Abyss of Nothing, to the Altitude of being Doctors of Physic, intruding into our Business with all the Impudence imaginable, to the great Abuse and Scandal of the Medical Art."

But the point which Dr. Taylor wishes to press home is that the enormous spread of these irregular practices at the confines of the medical art is permitted by the failure of teaching bodies to adjust their curriculums in harmony with the fullest requirements of the community. "The profession at large is rising to a clear recognition of its widening responsibilities in the broadest social and even political relationships. The medical schools are still bound by the traditions of medical education as it was thirty years ago." So far as psychiatry and this country are concerned, we hope that the successive resolutions of the Medico-Psychological Association and the British Medical Association will not be in vain, and that ere long thorough tuition in all branches of psychological medicine will be offered by every medical school. For the broader issues of Dr. Taylor's discourse we would refer readers to the article itself, but it is pertinent to the occasion to say here that he prophesies the development of an elective system of medical education. "It is not to be doubted that the wasteful method of demanding a detailed course in surgery, for example, from the prospective internist, or of obstetrics from the future bacteriologist, will give place to a more rational conception of the use of time. An elective system, modified to meet the special demands of the situation, is an inevitable outcome of the present state of affairs if our medical schools are to be the centres of educational activity which their equipment justifies."

In the foregoing we have of set purpose attempted merely to adumbrate the changing relations between the profession and the public as indicated by isolated instances selected from an address which should be read in its entirety. Although descriptive of American conditions and intended for American ears, Dr. Taylor's address is in some degree applicable to this country. The same changes are observable, and there is the same need for constant readjustment of medical teaching to meet these changes. Nebulous as yet, the altering conceptions of the functions and practical duties of the medical man may take this or that shape, may be guided by a united profession into fertilizing rains or crystallized by one-sided legislation into the first snows of the winter of our discontent. Readers of the deeply interesting correspondence in our columns upon proposed legislative changes will have observed the sharp cleavage of opinion even amongst medical men upon these proposals. It is outside the purpose of this article to

discuss these matters, but it is evident that if the profession is to secure in the future the just reward of its labours and to maintain its rights in the approaching conflict between individualism and collectivism, it must frankly recognize the altering status of the medical man in the social economy, decide upon a common plan of action to meet changing conditions, and present a solid front to all attempts to encroach upon its legitimate territory.

THE "MEDICAL REGISTER."

MR. H. E. ALLEN, Registrar of the General Council of Medical Education and Registration, asks us to draw the attention of members of the profession to the importance of keeping their addresses correct in the *Medical Register*. He points out that circulars are not issued every year, and practitioners should themselves notify changes. Failure to do this may result in the removal of the name, though every possible effort is made to avoid such a course, because it is impossible to communicate with the practitioner. No person whose name is not on the *Register* can give a valid certificate, and the signatures upon certificates of death are now compared with the *Register* by local registrars. Any practitioner who has any doubt as to the correctness of his address should at once communicate with the office of the General Medical Council. An acknowledgement of the receipt of all communications will be sent.

ADMINISTRATION OF THE POOR LAW.

A FIRST glance at the thirty-ninth annual report of the Local Government Board on the administration of the Poor Law, the Workmen's Compensation Act, and the Old Age Pensions Act, which was issued this week, reveals several interesting facts. The first is that, though the general increase in the number of persons receiving relief noted in the year 1908 was maintained during the first two-thirds of the year 1909, there was a considerable decrease in the latter third of that year. The net result was that on January 1st this year the ratio of paupers to population, exclusive of lunatics, was as 26.4 to 1,000, against 25.3 to 1,000 at the beginning of 1909. As for rate-supported lunatics, the increase in these which has been noted ever since the year 1886 still continues. In respect of expenditure, the gross outlay seems to be equal to an annual contribution by every single member of the population of England and Wales—man, woman, and child—of a sum of 8s. 4d. It may be added that there would seem to be the same marked difference in the cost of a pauper in London and in the cost of a pauper outside London as exists in the cost of beds in London and provincial hospitals respectively. It is also legitimate to conclude that the very large number of persons classed in the returns as able-bodied bears no strict relation to the number of workhouse inmates really capable of work. The term "able-bodied," in short, would seem to be rather more than less a conventional expression. Vagrancy, we note, is showing a tendency to diminish in southern and south-eastern counties, but is increasing in the eastern and western areas of England. Formerly, for instance, the tramp was hardly known west of the Tamar, but he is now a common and unattractive wayside object there, despite the efforts of the Cornish guardians. In view of the spread of education and the publicity given on posters to the claims of Cornwall to be regarded as a second Riviera, this is perhaps scarcely remarkable. A satisfactory feature in the report is the evidence of success of the movement against retaining children in workhouses and their annexes. Only one-sixth of the children for whom London unions are responsible now pass their lives amid the depressing influence of the workhouse ward. The progress is less notable in the provinces, but even there the number of children retained in workhouses has been reduced to only one-third of the total. On the other hand, an increase is to be noted in the number of children thrown upon the parish, as the phrase runs. One explanation of this would appear to be the stringency with which the Children Act of 1908 is now being enforced. In regard to the feeble-minded, our brief glance at the report only enables it to be said that this factor in the difficulties of Poor Law guardians is clearly increasing, and that the authors of the report seem alive to the importance of dealing with this portion of the rate-supported population on lines more satisfactory than those at present followed. The report also enters fully into the operations of the Pensions Act, and quotes here and there expressions of opinion from a large number of inspectors and other authorities on the subject in different parts of the country. None of them appear to have made up their minds finally as to what the effect of the Pensions Act will be on the call for indoor workhouse accommodation; a majority, however, seem inclined to think that the effect will be found to be practically nil, the workhouse population being neither increased nor decreased by the fact that persons who have reached the age of 70 years can, in ordinary circumstances, obtain a grant of 5s. a week. In this connexion a quaint circumstance is brought out, namely, that a woman who has married an alien remains an alien in the eye of the law even after his death, and is thus permanently disqualified for receiving an old age pension, however pure her Anglo-Saxon blood may be, and even though she herself has never left the country for an hour.

NOSTRUMS FOR RHEUMATISM.

ELSEWHERE will be found a further instalment of the series of analyses of proprietary medicines which have been published at intervals during several years. The present report deals with a number of the nostrums recommended for rheumatism and allied complaints. Both old and new preparations are included, and there is considerable variety in the nature of the articles, which comprise powders, pills, liquids for internal administration and external application, ointment, and plasters to be applied to the soles of the feet. The report gives extracts from the somewhat elaborate advertisements which are employed in most cases, and it will be seen that these usually show great ignorance on the part of the advertisers and assume no less ignorance on the part of the public. Other features which are common to many are the claim to be the only effectual remedy, succeeding where all others fail, the effrontery of the references to the medical profession, and the attempts to turn to account the popular prejudice in favour of wonderful discoveries by "natives," the mysterious curative power of "herbs," the knowledge possessed by the ancients and since lost, and so forth. The pseudo-scientific statements made in the advertisements include such nonsense as "Levasco has an exhilarating effect on every nerve and muscle, similar to a soothing electric current, which diffuses a gentle warmth, goes direct to the pain centres, and gives immediate relief. Levasco penetrates the skin, breaks up the uric acid, causing the blood to flow freely, the pain then ceases" (this liquid, essentially a strong tincture of capsicum with small quantities of essential oils and camphor, is not to be

applied to "wounds, cuts, or embrasures," the latter being presumably the advertiser's rendering of abrasions); "immediately the liniment has been applied it sets out upon its message of discovery and healing, travelling with lightning rapidity to the seat of the trouble"; "Dyxol has the power, above all other known preparations, of almost instantly dispersing congested blood. Its efficacy in this direction can be easily demonstrated. Rub one drop of Dyxol on the face, when, in less than one minute, the spot will temporarily redden through the flow of blood to the surface"; "Arthriticus cures Gout, Rheumatism, Rheumatic Gout, Lumbago, Sciatica, and all Rheumatic Affections. It contains no drugs"; "no one can reasonably deny an instinctive knowledge and a physical power exerted in the stomach by a conscious principle which selects and rejects, and which in its natural purity may be ranked as a nerve of sense"; "the rheumatic sufferer faces this situation: His or her system has become more or less clogged with rheumatic poisons—lithic acid, uric acid, lactic acid, or any other toxin, as the case may be." The mutually destructive claims made for different nostrums include the following: "Greatest and latest discovery in medicine . . . there is nothing known in medicine which will compare with it"; "the only efficient remedy ever discovered for these disorders"; "the finest cure for these complaints," curing "when all other remedies fail"; "we guarantee Magic Foot Drafts to cure any case of rheumatism"; "it is the One remedy that achieves a complete and permanent cure"; "the most effective scientific remedy." References to the medical profession are divided between claims of medical support for the particular nostrum in question and declarations of hostility. The former include such obvious falsehoods as "highly endorsed by the leading Medical Profession"; "physicians are already using them [Magic Foot Drafts] in their regular practice, and recommending them." The opposite attitude is shown in the following gross libel: "As certain medical men have done their best by tongue and pen to persuade the public that Box's Golden Fire is poisonous, the said Golden Fire in consequence has been submitted to a rigid Chemical Analysis. The following Report from the Eminent Analyst will effectually sew up the lying lips. . . . Those who raise the cry of 'Poison' are wholesale traffickers in the same—it is their stock-in-trade; Poisons bring grist to their mills, while the poor victims who swallow them perish by thousands." It is needless to say that analysis has not shown the presence of anything but quite familiar medicines in all the nostrums examined, and in almost every case the claims made for the curative powers of the compound are extravagant, often to a fantastic degree. The faith of the purchaser is not only stimulated as far as possible by reiterated assertions, but the price charged is usually enough to lead him to expect something of real value, and is quite out of proportion to the cost of the ingredients. Generally speaking, the greater the discrepancy between cost and selling price, the more numerous and lengthy are the advertisements; for example, one of the most persistently and blatantly advertised of these articles is the one sold under the name "Magic Foot Drafts," consisting of plasters to be worn on the soles of the feet, to draw out the "lithic acid, uric acid, lactic acid, or any other toxin—as the case may be"; the material of these is found to be a mixture of tar and powdered white hellebore root, the ingredients for a pair—for which the price is 4s. 6d.—being valued at one-sixth of a penny. The evidence of the lucrative nature of the making of quack medicines is abundant, and the advertisement columns of newspapers and other periodicals show the magnitude of the trade. The series of disclosures made in the BRITISH MEDICAL JOURNAL furnishes further evidence of the necessity for dealing with this evil by legislation.

INSURANCE ON THE CHEAP.

IN our issue for September 17th attention was drawn to the fact that the Pearl Insurance Company was endeavouring to persuade certain medical men to enable it to put a new venture on an assured footing by supplying the company with opinions as to the health of candidates for small policies in return for fees of the surgery cash price order. It was indicated that there was no need whatever for the medical profession to extend its benevolense to institutions of this order, and that the correspondents in question should refuse their co-operation on the terms offered. Communications have since reached us from other medical men to whom the same propositions have been made, but who had apparently overlooked the article in question, and also from certain medical men to whom another company seems to be making much the same proposal. Attention is therefore again drawn to the subject. The net effect of the article mentioned was that medical men should look after themselves and treat the applications received by them in precisely the same business spirit as those which instigate the making of them. It is just as much trouble to report on a candidate for insurance for a trifling sum as for one of £100, and the mere fact that the number of questions which have to be separately answered is reduced to a minimum, makes no difference in the amount of work required before a sound opinion can be formed, more especially if that opinion has to be given in such fashion as will allow of its wisdom being tested. There would seem to be reason to believe that the two companies in question are merely "trying it on," and that if they find they cannot get reports on their own terms they will pay those demanded, unless prepared—as does not seem to be the case—to continue a cheap policy adventure without the assurance of medical examination of candidates. This view is upborne by a recent correspondence with a company of quite a different order, one of the large well-known companies which do not cater especially for small policy seekers. The correspondence turned on the question why the company's agent had tendered a half-guinea fee in a certain case, and the fact was revealed that he had done so merely because in the locality where the case arose medical men proved quite ready to accept that sum instead of the guinea, which their fellows elsewhere habitually demand, and which the same company pays elsewhere without question.

MEDICAL CERTIFICATES AND SCHOOL CHILDREN.

DIFFICULTIES in connexion with this subject are constantly arising. At the Stafford Borough Police Court recently several parents were summoned for the non-attendance of their children at school, and evidence was given by two medical practitioners that such absence was due to illness. According to a report of the proceedings given in the *Schoolmaster* of September 17th the chairman of the bench said that Dr. Miller, one of the practitioners present, might easily have given a certificate of illness, and have saved the time of the court, which in his opinion had been wasted. Dr. Miller answered that he did not see why he should work for nothing, or why the medical profession should be exploited for any Education Committee, and in taking up this position he said he had the medical men of the town behind him. All fair-minded people must acknowledge that Dr. Miller's contention is unanswerable. If the State requires

certificates for the purpose of working the Education Acts it should be prepared to pay for them. At present it throws the onus of securing them on the parent, and when parents are willing to pay the doctor no trouble need arise. When, however, parents will not, or cannot, pay, it is unreasonable for magistrates or education authorities to expect medical practitioners to do the work for nothing. It is satisfactory to learn that the medical profession in Stafford are united in this matter. If the time of the courts is constantly "wasted" in this way, it may be found cheaper in the long run to pay medical practitioners their just claims rather than defray the costs of much unnecessary legal procedure throughout the country.

ROYAL PORTSMOUTH HOSPITAL.

At a meeting held in the Town Hall, Portsmouth, on September 26th, it was proposed by Sir John Brickwood, and supported by Admiral the Hon. Sir A. G. Curzon-Howe, K.C.B., Commander-in-Chief at Portsmouth, that the Nurses' Home at the Portsmouth Hospital, which has been built at a cost of about £8,000, and will be opened on October 5th, should be the local memorial to King Edward VII. Towards the amount required, a sum of £3,500 has been promised, so that £4,500 is required to complete the work, the urgent necessity of which is fully recognized by all who know the work of the nurses and the inadequate accommodation hitherto provided for them. It is a happy coincidence that the opening of this local memorial to the late King should take place on the sixty-third anniversary of the laying of the foundation stone by His Royal Highness Prince Albert. Since then the hospital has enjoyed royal patronage, and King George has conspicuously displayed his interest in it.

THE EARLSWOOD ASYLUM.

All interested in the good work carried on at Earlswood Asylum will sincerely regret that its financial position, sufficiently gloomy at the time of the last annual report, has not improved during the year 1909. The Board of Management, in fact, in its report lately published (1) say that the loss of income has been so considerable that a modification of the rules and by-laws of the society to tide over their present difficulties has been necessitated. The annual subscriptions were £240 less than usual, and in addition there were reduced receipts from legacies amounting to £3,250 less than the usual average. Rule 88 provides that 25 per cent. of all legacies shall be invested to create a reserve fund; but because the ordinary income—to some extent diverted to meet exceptional expenditure for repairs—had become insufficient to meet the maintenance expenses, this rule had to be suspended. In these circumstances we join with the board in hoping that the sympathy and liberal help of the friends of this charity will be continued. It may be of interest to some of our readers to know that the senate of the University of London has recognized the asylum as an institution at which appointments may be held for the purposes of the M.D., Branch 3 (mental diseases) examinations, and has approved the appointment of the junior assistant medical officer for the purposes of that examination.

ANTITOXIN IN DIPHTHERIA.

We learn from the *Boston Medical and Surgical Journal* of September 15th that in the last Monthly Bulletin of the State Health Department the attention of medical practitioners of the State is directed to the advisability of a more prompt and general use of antitoxin in the treatment of diphtheria. The mortality from diphtheria treated by State antitoxin for the last two years was practically 10 per cent., while before the period of antitoxin the mortality in cases of diphtheria was at least 45 per cent. In 1909 there were 2,036 deaths from the disease in the State of New York, which could not have come from less than 20,360 cases, or fully 235 cases of diphtheria for every 100,000 of the population. The following comparative figures as to mortality are then given:

	1902.	1903.	1904.	1905.
State of New York	37.7	39.02	38.04	28.04
City of New York	53.0	56.0	57.0	38.0
City of Paris	20.0	15.0	9.0	6.0

Since 1905, it is stated, there has been no appreciable change in these relative proportions:

	1908.	1909.
State of New York	28.9	27.05
City of New York	37.1	38.00

It is argued, therefore, that if the mortality from the disease in New York State and City exceeds that in Paris, the fault is most likely to be found in the extent or method in which the diphtheria antitoxin is employed. Careful investigation of the quality of antitoxin would indicate that Paris has no advantage in this respect over that of the antitoxin supplied by the New York State Health Department. The reasonable conclusion, therefore, would seem to be that the cause of the excessive mortality in New York State, at least over that of Paris, is for the most part to be attributed to a failure to utilize antitoxin in the treatment of this disease to anything like the extent which prevails in Paris.

DAY CAMPS AND NIGHT CAMPS FOR TUBERCULOUS PATIENTS.

In the *Medical Record* of New York for September 3rd, 1910, Mr. N. Gilbert Seymour describes the work of the day and night camps for the tuberculous in the City of New York. Several of these are arranged on board abandoned municipal ferryboats, given by the city and maintained by various clinics. He states his belief that these camps are in at least three ways a very important part of the crusade against tuberculosis. They provide the essentials of treatment—that is, rest in the open air under proper supervision; they provide a place where sanatorium discipline and methods may be taught the patients; they provide a place for sanatorium treatment for those persons able to work during the day. One called the Southfield is maintained by Bellevue Hospital; another called the Westfield by the Gouverneur Clinic; a third, the Middleton, by the Presbyterian Hospital. These boats were renovated and provided with the necessities for a day camp, to be used summer and winter; there are sanitary arrangements, water, steam heat, and kitchen facilities, together with the necessary beds and bedding. Each is visited daily by the physicians, and maintains a staff of nurses and attendants. Those able to do so assist in the work, and others sit in steamer chairs and read, sew, or talk, except during meal or rest hour, when silence is maintained. The cost is moderate. Some patients remain both night and day. A hot noon meal is provided and milk and eggs between meals. A school for children is held in the open air. The results in improvement of general condition and physical signs are very encouraging.

ANTIVIVISECTIONISTS AND SPORT.

OUR antivivisectionist friends have the "gift of the gab," but they have not the saving gift of humour. We read in the *Aberdeen Daily Journal* of September 16th that an address entitled "Our Animal Friends and Vivisection" was recently delivered at Balavil House, Kingussie, by Miss L. I. Lumsden, of the National Antivivisection Society. "There was," it is added, "a large and fashionable gathering of ladies and gentlemen, most of the shooting parties and other visitors to the district being represented." Miss Lumsden, it is stated, made an earnest appeal to those present to support the society in the work it was doing in the interests of animals, and strongly denounced the methods adopted by the medical profession when experimenting on animals. We are sure the sportsmen present were loud in their applause of her eloquent fulminations, but we think it probable that Miss Lumsden took care not to condemn the torture of wounded animals lingering in agony to make a sportsman's holiday. But what would the grouse and the deer say if they could speak! The situation recalls a famous caricature of the Revolutionary period where a peasant, with a murderous-looking weapon in his hand, appears in the farmyard and blandly asks the frightened denizens: "My dear animals, with what sauce would you like to be cooked?" To their unanimous reply that they would prefer not to be cooked at all, the cook answers: *Vous vous écartez de la question!* A similar answer would probably be given to sportsmen by their "animal friends" if the question was put to them. Let the people who delight in maiming birds, wounding deer, and dragging salmon about, it may be for hours, with a hook in their mouths, take the beam out of their own eyes before they speak of the mote in those of vivisectors.

OPTIC NEURITIS OF MENSTRUAL ORIGIN.

IN the *Recueil d'ophtalmologie* for June, 1910, L. Ronnaux draws attention to the connexion which can sometimes be traced between optic neuritis and menstrual irregularity. In a previous number of the BRITISH MEDICAL JOURNAL we pointed out that cases of optic neuritis occasionally occurred in chlorosis, a disease constantly associated with amenorrhoea. These somewhat rare cases are possibly allied to those described by Ronnaux, who ascribes the inflammation of the optic nerve to the action of toxines secreted by the ovaries at the time of disordered menstruation. The optic neuritis may be a retrobulbar neuritis with little or no ophthalmoscopic change, or it may take the form of choked disc with haemorrhages in the retina. The author describes three cases which came under his notice. In the first patient, aged 30, menstruation had been perfectly normal. There was then an irregular loss which lasted four days, and then menstruation became irregular, rarely passing ten days of the month without loss. This condition lasted a year, after which the sight began to fail. The right visual acuity sank to zero, the left to $\frac{1}{2}$. There was a definite central scotoma. The loss of vision was due to a retrobulbar neuritis, which caused no alteration in the appearance of the retina. As soon as menstruation again became regular, vision improved to $\frac{2}{3}$ and remained good. The second case was one of severe metrorrhagia in a woman of 30, who had always had normal menstruation. When seen she was much blanched, and had severe optic neuritis (choked disc) with retinal haemorrhages, very like an albuminuric retinitis. A small amount of albumen was present in the urine. When the uterine condition was treated and the haemorrhage arrested the vision rapidly improved. The third case was one of sudden amenorrhoea following a chill. The lids were found red and swollen. The right pupil was dilated and acted sluggishly, vision being reduced to finger counting at 50 cm. A central scotoma was present. The left eye had a good pupillary reflex V. = $\frac{1}{2}$, but here, too, there was a central scotoma. The fundi were normal. A diagnosis of retrobulbar neuritis was made. Three days later all vision was lost and there was violent headache. The eyes were congested, tender, and painful. Choked discs and retinal haemorrhages were now detected. The vision improved under treatment and menstruation returned. Eventually sight became normal. Ronnaux advises that whenever optic neuritis is discovered in a female the condition of the menstrual functions should be investigated, and any irregularity should receive adequate attention.

JURIES AND MEDICAL EVIDENCE.

IN the *Daily Telegraph* of September 27th there is an account of an inquest held in the Battersea Court before Mr. Troutbeck. Dr. Freyberger, who had made an autopsy, said that death was due to heart failure following erysipelas, set up by injury to the knee when the deceased was suffering from the effects of chronic alcoholism. The coroner pointed out that on the evidence the death was clearly due to an accident. The foreman of the jury, however, after consulting with his colleagues, said: "We find it was caused by the medical evidence." That this was no Malapropian "derangement of epitaphs" was shown by the fact that on being questioned by the coroner, the jury refused to agree that the death was the result of an accident, and persisted in declaring that the injury had nothing to do with the fatal issue. How they arrived at the sapient conclusion that the medical evidence was the cause of death does not appear. This verdict may be added to those cited in the Report of the Select Committee on Death Certification where Dr. Ogle is quoted as saying: "One verdict came before me a little time ago, which was this: 'A man died from stone in the kidney, which stone he swallowed when lying on a gravel path in a state of drunkenness.' That was given as a verdict. I thought some joke had been played, and I wrote down about it and found it was an absolute fact. Another one is this: 'Child 3 months old found dead, but no evidence whether born alive.'" Juries may, however, be excused if they sometimes find the medical evidence puzzling. We have recently come across an example in an American journal. A "leading citizen" in a certain town was taken before the magistrate charged with assault and battery. One of the witnesses was a local doctor whom the prosecuting attorney proceeded to worry, suggesting that he was prejudiced in favour of the defendant and had therefore wilfully distorted his evidence in his favour. The doctor denied this, and went on to say that the defendant was suffering from "phalacrosis." The word caused a sensation in court, and, asked to define the disease, the doctor described it as "a sort of chronic disease of an inflammatory nature which affects certain cranial tissues." Asked if it affected the mind, the doctor said he was not posing as an expert, but he had known some persons who were suffering from the disease become raving maniacs, others merely foolish; some showed destructive and pugilistic tendencies, while many others had suffered for years and had never shown any mental abnormalities. He refused to say anything further, and the jury promptly acquitted the "leading citizen," because

as the foreman explained, "Doc said there was something the matter with his head." When the case was over the prosecutor sought enlightenment as to the mysterious disease, and found that "phalacrosis" meant—baldness!

AUTOCHTHONOUS AMOEBIC DYSENTERY IN FRANCE.

In a recent number of the *Semaine médicale* (No. 34, August 24th) Dr. Ch. Garin, of Lyons, has published a case of amoebic dysentery which was in the Red Cross Hospital at Lyons under the care of Professor Paviot early this year. The patient, who was a woman aged 41, had never been out of the city except to visit her native village, and had had no relations with persons who had lived in the colonies. For nine years she had suffered from chronic diarrhoea, with consequent great wasting and loss of strength. The stools were very liquid, yellow, with glairy flakes in them, and microscopical examination showed the presence of numerous amoebae, which threw out pseudopodia very actively in freshly emitted stools. The amoebae are believed by Dr. Garin to differ from the *Amoeba histolytica* or *Amoeba tetragena*, and to constitute a separate variety, to which he thinks this autochthonous dysentery is due, but he proposes to publish a further note upon the morphology of this organism. He was able to produce the disease in kittens by rectal injection of dysenteric faeces. The disease developed in ten or eleven days, and proved fatal in two or three weeks. In all cases lesions were found in the large intestine, most marked at the caecum and at the terminal portion of the rectum, but they were neither severe nor in proportion to the gravity of the disease. They consisted of a sort of adherent exudation under which the mucous membrane was swollen and thickened, showing in places little red ulcers of the size from a No. 8 shot to a lentil. This case is interesting, as last year we published[1] a paper by Professor Saundby and Dr. Miller, of Birmingham, on a case of amoebic dysentery which had occurred in a man who had never been away from Birmingham, but the authors seem to have had no doubt that the organism present was the *Amoeba histolytica*. We shall therefore be curious to learn the distinguishing points upon which Dr. Garin relies for his belief that the organism in his case belongs to a separate variety.

ANTIDIPHTHERIA SERUM IN OPHTHALMOLOGY.

Dr. A. Yvert[2] has obtained most encouraging results from the administration of serum to patients suffering from infective inflammations of the eye, such as corneal ulcer, iritis, infected wounds, and sympathetic ophthalmia. Our knowledge of the para-specific or polyvalent action of various serums is due largely to the energy of Darier, who for the past seven years had advocated their use in ophthalmic surgery. Deutschmann, of Hamburg, too, has published wonderful results which he has obtained from a special serum obtained from rabbits which have been fed upon yeast. Yvert points out that the value of antidiphtheria serum rests not in the antitoxin it contains, but in the serum itself. Almost all serums are active. Human serum is the best, and ox serum the worst, but horse serum is the most convenient and practical. The antidiphtheria serum is generally used because it is the most easily obtained. It may be administered either subcutaneously or by the mouth or subconjunctivally. The buccal method is the most convenient; 10 c.cm. can be given daily for eleven days, but Darier gives this dose every hour at first, and then when the disease shows signs of improvement, every two hours. There is an interesting paper upon the administration of antitoxin by McClintock and King in the *Journal of Infectious Diseases*, February, 1909. Yvert describes a case in which the condition of an eye after a perforating wound was so bad that at the patient's own request enucleation had almost been decided upon. But serum was tried and the eye at once began to recover. It has proved eminently useful in cases of severe hypopyon ulcer. Darier states that since he has used serum as a routine adjunct to other methods of treatment he has (in seven years) never seen a single case of sympathetic ophthalmia follow an accident or an operation. We ourselves have recently seen an inflamed eye rapidly improve under Paton's serum given by the mouth.

[1] British Medical Journal, March 27th, 1909, p. 771.
[2] *Recueil d'ophtalmologie*, May, 1910.

THE PROPHYLAXIS OF ANKYLOSTOMIASIS.

In a supplement to the *Ceylon Observer* of June 25th, 1910, a summary of the steps taken for the prevention of ankylostomiasis in Ceylon and other places is given. Sir Patrick Manson, it will be remembered, opened a discussion on this subject at the meeting of the British Medical Association at Sheffield in 1908, and copies of the reports of this discussion were sent out to the different colonies by the Earl of Crewe, Secretary of State for the Colonies. Sir A. Perry reports from Ceylon that the planters (as far as he knows) have taken no action to improve the health of their labour forces along any of the preventive lines indicated. One would have thought that they of all people would have been the ones to support measures of this sort, because after all, they are the losers when ankylostomiasis becomes rife amongst their coolie labourers. However, they have not, and Sir A. Perry believes that nothing short of an ordinance will force the hands of employers of labour to introduce latrines for their coolies. As this is the crux of the ankylostomiasis problem, nothing of practical value can accrue until such works are put in hand on plantations and in other places, and for the general health of the population in these localities it is to be hoped that this will not be long.

The annual dinner of the Association of Public Vaccinators of England and Wales will be held at the Hotel Cecil, Strand, on Friday, October 28th, at 6.30 p.m.

Field-Marshal Viscount Kitchener of Khartoum will distribute the prizes at the opening of the seventy-sixth winter session of the Middlesex Hospital Medical School on Monday, October 3rd, at 3 p.m.

We regret to announce the death of Madame Pasteur, the widow of Louis Pasteur, at the age of 84. For many years she was an enlightened helpmate to her husband in his scientific researches, and took an active interest in philanthropic work.

A new centenary wing of the West of England Eye Infirmary, Exeter, was opened on September 21st by Earl Fortescue, Lord Lieutenant of Devon, in the presence of a large and distinguished attendance. The infirmary was founded in 1808.

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

LEEDS.

The University.

The classes in the Faculty of Medicine will be resumed on Tuesday, October 4th, when the opening address to the students will be given by Mr. Howard Marsh. It is hoped that many former students of the school will be present. The annual dinner of the medical profession of Leeds and district takes place the same evening, when Mr. Howard Marsh will be the chief guest, and Mr. R. Lawford Knaggs, Professor of Surgery, will be in the chair.

West Riding Medical Charitable Society.

The annual meeting of the West Riding Medical Charitable Society was held on September 22nd in Bradford, under the chairmanship of Dr. R. Hamilton. Last year the society had to record the death of its valued Treasurer, Mr. C. G. Wheelhouse, and the appointment of Mr. G. H. Rowe, who had so long acted as Mr. Wheelhouse's right-hand man, to succeed him as Treasurer. It was hoped and expected that for many years there would be no change in the office. The untimely death of Mr. Rowe has destroyed this hope, and the meeting was held under the shadow, one may say, of a double loss. Dr. Eddison, who, though he has retired from practice, retains a keen interest in the affairs not only of this society but in the management of the infirmary and in that of the Medico-Chirurgical Society, was selected to fill the position of Treasurer, and Mr. Michael A. Teale was reappointed Secretary. It is not necessary to comment at length on the work of this admirable society. Grants amounting to £1,645 were voted to some 50 applicants, on the recommendation of the stewards, and after careful investigation of the claims by the committee of stewards. Last year the grants made amounted to £1,625. The total amount of grants voted since the inception of the society amounts now to the handsome sum of £49,595 10s. The amount of good done by the association is really incalculable. Its work stands high in the affections of all its members, and, large though its membership is, it is matter of lasting surprise to those who know how it is managed and who know the amount of good work it does, that every medical man in the West Riding does not at once join its ranks.

Prosecution of an Unregistered Midwife.

Because it is the first of its kind in Leeds, it may be of interest to make reference to the conviction of a woman for habitally practising as a midwife without being registered. The accused had been practising as a midwife up to the time of the Midwives Act in 1902. She applied for registration to the Central Midwives Board, but her application was refused. On the same day that her application was refused, she attended a case and was paid. Some attempt was made to set up a defence on the ground that though confinements were attended, it was the *nursing* that was charged for, but a conviction followed. A penalty of £5 was imposed, but the fine was not to be enforced if the defendant ceased practising as a midwife.

WALES.

Glamorgan County Council.

In his annual report for 1909, Dr. W. Williams, the County Medical Officer of Health, states that there has been no change in the area of the administrative county during the year. The population of the administrative county according to the census, 1891, was 467,954; in 1901 it was 601,092; whilst the estimated population in 1909 was 689,343. (The Merthyr Urban District, with a population of 77,219 was constituted a county borough during 1908.) There were 24,190 births registered, equivalent to a birth-rate of 35.09, whilst the number of deaths was 9,809, giving a general death-rate of 14.22, which is 0.28 lower than the average death-rate for England and Wales, and 0.28 lower than that of the seventy-six great towns. Of the total deaths registered, 2,834 were those of children under one year, and 1,098 of children 1 year of age and under 5 years. The infantile mortality-rate was 117, as against 152 in 1908. The causes of the relatively high infantile mortality are discussed at some length. The county rate for zymotic diseases is 1.14, as compared with 2.21 for 1908, and 1.12 for England and Wales. The death-rate from small-pox is the same as that for England and Wales—namely, 0.00. The number of deaths from the various forms of tuberculosis was 800, or about one-twelfth of the total number of deaths from all causes; and yet, compared with the action taken against the ravages of scarlet fever, diphtheria, and typhoid fever, which altogether accounted for 211 deaths, very little is being done towards stamping it out. Considerable progress has been made in the matter of isolation hospitals. In dealing with the inspection of meat and other articles of food, particulars are given of the generous scheme of the Glamorgan County Council, whereby all sanitary inspectors within the administrative county are enabled to specially qualify, free of all cost, as inspectors of meat and other foods. The scheme provided for a course of twenty-four lectures and demonstrations, which were held at a public abattoir situated in a convenient centre of the county, these classes being followed by further classes and practical demonstrations, etc., held at the Metropolitan Cattle Market, Islington, and the Billingsgate Fish Market; these latter classes covered a period of three weeks. Provided 80 per cent. of the total attendances were made, the student's train fares were paid to the local centre, together with return rail fares to London and a maintenance allowance of 30s. per week each during their three weeks' stay in London. These privileges were open to all persons residing within the administrative county of Glamorgan who already held the inspectors of nuisances' certificate, or that of the Sanitary Inspector's Examination Board, London. As only about one-half of the number of sanitary inspectors in office were able to leave their districts, it is the Council's intention to hold a further course of instruction. The County Education Committee (on the representation of Dr. W. Williams, the County Medical Officer and Chief Medical Inspector of Schools) rightly regarded food inspection as a branch of technical education, and the above scheme was approved by the Board of Education. It is worthy of note that this scheme is the most generous one that has yet been initiated in the United Kingdom, and it is to be sincerely hoped that it may prove a forerunner of many others in the various counties, so that uniformity of inspection may be carried out in this important branch of public health work. The work at the Cardiff and County Public Health Laboratory has been systematically carried on and is highly appreciated by medical officers of health and others.

In his annual report to the Education Committee as school medical officer Dr. Williams states that the three medical inspectors paid 367 visits to schools, the number of children examined being 13,407—namely: boys, 4,280 entrants, and 2,595 leaving; girls, 4,144 entrants, 2,388 leaving. At the routine examination no less than 3,488, or 35.39 per cent., were found to be physically defective, minor ailments not being included. In addition to the above, 3,638 children have been presented to the medical inspectors by the head teachers at the various schools to be specially examined on account of (*a*) physical and mental defects; and (*b*) uncleanliness. As to clothing and footgear, the figures given are rather better than those for 1908, the girls giving better results than the boys. Overclothing is more prevalent than underclothing, and many of the smaller boys wore children's corsets. Boots could most frequently be found fault with. Shawls, scarves, and mufflers are frequently worn, but, believing them to be unhealthy to wear, their use was discouraged. The results under the heading of Nutrition are better than those for 1908; the nutrition of

the girls being slightly better than that of the boys. In very few cases was there reason to believe that subnormal nutrition was due to underfeeding. In almost every case there was an adequate cause, such as bad teeth, digestive disturbances, improper diet, tuberculous diseases, or discharging ears. The general physical condition of scholarship candidates is said to be usually superior to that of the ordinary child. Children dirty in person and clothing were often found to be well nourished, but there was a marked falling off in the nutrition of the older children from the same families, showing that the home conditions took years to produce marked deleterious effects, but they were produced none the less certainly. In respect of cleanliness and condition of the skin, the figures agree very well with those for 1908, showing that no great improvement has taken place, though verminous condition of body and head is less frequent. There is an improvement in the cleanliness of the girls' heads, but there is still a greater improvement needed. The condition of the children's teeth is said to be deplorable, but among children from very poor districts seem somewhat less bad than in children of schools of better class districts. The figures relating to the nose are much the same as those for the preceding year, while the percentage for external eye diseases is lower, and defects of vision are more common in girls than in boys. On the whole ear disease was rare, the figures being: boys 2.9 per cent., while that for girls is 3.1 per cent. Out of 13,407 children medically inspected only 8 were found to be mentally defective.

Scotland.

[FROM OUR SPECIAL CORRESPONDENTS.]

The Medical and Dental Defence Union of Scotland.

The eighth annual report of the Medical and Dental Defence Union of Scotland has just been issued. The council report that the past year has been a prosperous one, and that substantial progress has been made. The membership has continued to increase, and the financial position is a thoroughly sound one. The policy which the Union has adopted in dealing with claims made against members, and in difficulties which arise out of professional practice, has become recognized amongst claimants and their advisers, and there has been ample evidence that during the past year this policy has been a great benefit to the members. The financial report, as shown in the balance sheet, shows a satisfactory result. The income for the year is £630 7s. 10d., and the expenditure £241 9s. 5d., leaving a balance to the credit for the year of £388 18s. 5d.

The membership at the close of the financial year was 1,189, and 76 new members were admitted. In response to numerous applications by members of the English defence societies as to terms on which they will be accepted as members of the Scottish Defence Union, the council some time ago agreed to admit without entrance fee any practitioner residing in Scotland who was an active member of an English society. During the year under review, a considerable proportion of the new applications for membership has been from practitioners who were members of such societies.

Caledonian Medical Association.

The annual meeting of the Caledonian Medical Association was held at Fort William on September 23rd. Dr. A. C. Miller, Fort William, was elected president for 1910–11.

A paper entitled "The Physician in Fiction" was read by Dr. Miller. Other contributions, including one of special local interest by Professor McKendrick on "Reminiscences of Lochaber," were submitted.

The members dined together in the evening. The toast of the society was proposed by Provost Mackenzie, Fort William, and amongst other speakers and guests were Sir Hector Cameron; Dr. Alexander Carmichael, Edinburgh; Dr. Macphail, Derby; Dr. Macnaughton, Stonehaven; and Dr. Cameron Gillies, London.

Glasgow and the Tuberculosis Exhibition.

The Town Council of Glasgow, at its meeting on September 22nd, adopted the recommendation of the Committee on Health that the Corporation should pay the expenses of the Tuberculosis Exhibition, estimated at about £250, and that the exhibition should be held in the city in the spring of 1911, instead of in October of this year, as originally contemplated. A special subcommittee was appointed to make the necessary arrangements in conjunction with the District Branch of the National Association for the Prevention of Consumption. An educational programme of special popular lectures will be a feature connected with the exhibition, and every effort will be made to obtain valuable results of a permanent nature.

Dundee.

Sidlaw Sanatorium.

Sidlaw Sanatorium, as mentioned in the Journal of September 24th, p. 902, is about to be reopened under the sway of the directors of Dundee Royal Infirmary, for cases of tubercle, both medical and surgical. The fact makes interesting the question of its medical and administrative organization. Three schemes have been suggested. The appointment of a superintendent who should be personally responsible for both medical and administrative management would recall the condition previously existing, while the opposite proposal is the appointment of a senior house-surgeon and physician who would be under the medical direction of certain members of the medical staff of the infirmary, and under the administrative control of its medical superintendent. An intermediate suggestion is that while the medical and surgical treatment should be under the advice of the medical staff, the medical officer appointed should in administration be responsible only to the directors.

Between Nursing Home and Infirmary.

The difficulty of providing for those able to pay small fees for treatment, but unable to face a charge of three or four guineas a week, has given rise to a lively newspaper correspondence apropos of a forthcoming bazaar for a small local hospital which was established to provide for women who wished to be attended by women practitioners. A suggestion has been made that the time has come for the establishment of a co-operative home somewhat on the lines of the one recently organized in Edinburgh. So far nothing definite has been done in the matter.

Lawyer and Doctor.

Though the Fatal Accidents Enquiry Act conferred on Scotland some of the doubtful advantages of the procedure of the coroner's court, the medical profession has not been greatly vexed by judicial *obiter dicta* such as are so familiar in the South. Apropos of a case in which a man who, having had two injured toes amputated at the infirmary, was sent home, and who, after readmission a few days later, died of tetanus, the sheriff-substitute, seemingly more in sorrow than in anger, made some severe strictures on the young doctors of the institution. The injustice of the remarks would have evoked resentment had they not, as the local newspaper pointed out, been born in ignorance of the facts; it is a circumstance to which, in medical and sanitary matters, this judicial personage has so accustomed Dundee, that each new decision, however absurd, is received without astonishment.

The Local Government Board Inspector and the Slums of Inverness.

Severe strictures have been passed by the Local Government Board Inspector in a report which he submitted to the Board, and which has been forwarded to the Town Council of Inverness for information. In the course of his report Mr. Jeffrey

refers to the housing accommodation of the paupers and the sanitary arrangements provided for their use. Dealing with the general question, he reports as follows:

"A considerable proportion of the aged poor are in houses which are in a dirty condition; some are so bad, in fact, as to call for the intervention of the sanitary authority, and it might afford a salutary lesson if a few cases were reported to that authority and action taken with regard to them. With regard to the housing accommodation and sanitary arrangements generally, I may state that, in the course of my experience on the Poor Law Commission, I have, along with the Commissioners, visited the homes of paupers in the principal towns of England, Scotland, and Ireland, and that I have never witnessed urban paupers living under worse conditions than those obtaining in Inverness. That some very bad slums exist in the towns is notorious."

The Local Government Board, in forwarding this report to the Town Council, states that the condition of matters disclosed by Mr. Jeffrey's report appears to call for the immediate attention of the local authority, and the Board trusts that the local authority will at once put itself in communication with the Parish Council, and act in hearty co-operation in removing the insanitary conditions under which the paupers live. The sanitary inspector, in his remarks on the letter, says the strictures of the Local Government Board report are too general and too highly coloured. Dr. MacDonald, medical officer of health, also criticized the report.

Greenock Corporation and Phthisis.

A subcommittee appointed by the Greenock Town Council to consider the question of the treatment of phthisis cases in the public interest has recommended that an endeavour should be made to isolate and treat certain cases; that an outdoor dispensary be provided for pulmonary phthisis, where medical advice and medicine will be obtained free of cost; that a nurse should be appointed to work in connexion with the dispensary and to follow up the home conditions of the cases; and that compulsory notification of phthisis should be adopted by the local authority. It also reported that Councillor Orr had intimated his intention to offer to erect a pavilion to accommodate ten paying patients on certain conditions. With a sum of £500 the committee thinks it would be possible to begin operations for the control of the disease in the town, and it recommended the provision of this sum in the council estimates. The Town Council adopted the committee's recommendations.

Scottish Vital Statistics.

In the detailed report which has now been issued some interesting information is given regarding the births, deaths, and marriages registered in Scotland during 1908. That the report should be issued some eighteen months after the close of the year is explained by the fact that the abstracting of the various details cannot be completed and the compilation of the statistical tables therefrom commenced until the expiration of twelve months after the registers are closed.

Among the more noteworthy features of the year under review were the lowness of the birth-rate, the marriage-rate, and the death-rate. The birth-rate—27.22 per 1,000—was slightly above that of 1907, but was lower than those of all previous years since the institution of national registration, and that is since 1855. The marriage-rate was lower than those of all previous years, with the exception of five—those of 1858, 1879, 1886, 1887, and 1888. The death-rate—16.13 per 1,000—was lower than the death-rates of all previous years, with the exception of 1905 and 1906.

Scottish Centenarians.

Among the recorded deaths there were those of 21 reputed centenarians, of whom 5 were men and 16 women. In the previous year deaths of reputed centenarians numbered 17—3 men and 14 women. Of 1908 centenarians, 6 women and 1 man were stated to be 100 years old; 6 women and 2 men between 101 and 105 years old; 3 women and 2 men between 106 and 110 years old; and 1 woman, the widow of a crofter, was stated to be 112 years old.

The Declining Birth-rate.

Mr. Alexander M'Kinlay, clerk of the statistical department, contributes an article on the decline of the birth-rate, and he gives the following deductions which he has drawn from a study of these tables: (1) That the decline of the birth-rate is to some extent due to the decreasing number of illegitimate births; (2) that the decline of the legitimate birth-rate is not due to the alteration in the numbers of married women of child-bearing age; (3) that the decline of the rate based on these numbers is only to a small extent due to the increased age of women at marriage; (4) that it is almost entirely due to a declining fertility of marriage; (5) that this declining fertility of marriage is more marked in urban than in rural districts; (6) that during recent years the variations of the marriage-rate have had less influence on the birth-rate than was the case in earlier years.

Ireland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

Payment for Extra Professional Assistance.

In May of this year the Drogheda Board of Guardians passed a resolution to the effect that if dispensary doctors required extra medical assistance in urgent cases they must requisition the services of another dispensary doctor, and that no fees would be paid for other assistance. A case illustrating the injustice of this resolution came before the guardians at their last meeting. It appears that a dispensary doctor, Dr. Smyth, was attending a difficult maternity case, and sent for assistance to a brother dispensary officer. This dispensary officer was not at home, and, in consequence, the services of Dr. Hunt of Drogheda were obtained. On application being made to the guardians for payment they refused Dr. Hunt's fee, and decided to adhere to their resolution. We are surprised that the guardians do not realize that an action of this sort is directed more against the interests of the poor, whom it is their duty to protect, than against the medical profession, and we hope that the matter will be taken up strongly by all the medical men concerned.

Water Supply for Labourers' Cottages.

Some weeks ago we referred in these columns to a correspondence that had taken place relative to the approval of sites for labourers' cottages in various parts of Ireland, in spite of the fact that no water supply was available. The question has again been raised owing to summonses having been served on a number of tenants of district council cottages at Killakee, who refused to pay rates on the ground that there was no water supply to their houses. The nearest water supply was stated to be two miles distant, and although application had been made to the South Dublin Rural District Council six months ago nothing had been done. The magistrates—amongst whom was the Right Hon. T. W. Russell—expressed themselves in favour of sending a strong protest to the Rural District Council, and also expressed the opinion that no place is a suitable site for the erection of a cottage if there is not a proper supply of water convenient to it. A solicitor present said that he had been present at many inquiries regarding suitability of sites, and had never heard a want of water supply put forward as a reason why a site should not be acquired. The present publicity will, we hope, induce Local Government Board inspectors to be more careful in this respect.

South Australia.

[*FROM OUR SPECIAL CORRESPONDENT.*]

The South Australian Branch of the Association.

The medical year has been tranquil, and comparatively uneventful. The annual meeting of the local Branch took place on June 29th, when Dr. W. A. Verco delivered a thoughtful and original address on the influence which the medical profession might, could, and should bring to bear upon the national life in Australia; it was an able discourse on eugenics, broad in its purview and elastic in its application. His successor as President is Dr. W. T. Hayward, the Senior Physician to the Adelaide Hospital, who occupied the same chair just a quarter of a century ago. Dr. Hone was elected Vice-President. The usual dinner took place in the evening.

Australian Army Medical Reserve.

Surgeon-General Williams, C.B., paid a visit to Adelaide last month, and addressed a large special meeting of the Branch with a view to bringing up the reserve to its proper war footing. General Williams's reputation as an administrator stood the test of comparison with the British authorities both during the Soudan Expedition and the South African war. The present scheme for a reserve is comprehensive, and seeks to enrol all medical men, chemists, dentists, and medical students, together with members of the St. John Ambulance Society. There is plenty of material to choose from, and there should be no difficulty in filling the ranks.

Diphtheria.

The outbreak which commenced two years ago seemed to abate last Christmas; but with the re-opening of the State schools it broke out again immediately, and has during the past six months assumed the proportions of an epidemic in Adelaide and its suburbs, whilst small outbreaks have been reported in many country schools. The Children's Hospital increased its accommodation from about a dozen to over forty beds, and the General Hospital has had to provide another 60 beds. Nor is the outbreak confined to South Australia, for it has affected the Eastern States as well—so much so that there is a threatened scarcity of antitoxin. A simple way of ending it would be to close all the schools for a few months, and probably then the epidemic would be speedily stamped out.

Hospital Appointments.

The post of Superintendent of the Adelaide Hospital, vacant by the resignation of Dr. Wells, has been filled by the appointment of Dr. de Crespigny of Victoria, who adds considerably to the strength of pathology in South Australia. A former superintendent, Dr. Bronte Smeaton, has been appointed Assistant Surgeon, vice Dr. Frank Magarey, resigned.

District Nursing.

This subject has been invested with considerable interest lately on account of the scheme proposed by Her Excellency the Countess of Dudley for supplying nurses in bush districts. To give effect to her scheme Lady Dudley induced Mr. Harold Boulton, M.V.O., and Miss Amy Hughes to travel out to Australia to spy out the nakedness of the land. The scheme has rather hung fire for various reasons. In the first place, everyone was informed that it was to be, and no one was asked whether it would be either practicable or acceptable. Then when it did hang fire an unwise attempt was made to tack it on to a memorial to the late King. Ultimately the "bush" idea was allowed to subside into the background, and the memorial suggestion was dropped, because the various States had already contributed handsome sums for statues and other objects. In its latest form the scheme is simply one of extension of district nursing, and opposition to this was at once manifested in South Australia, where a very successful society has been in existence for some sixteen years; it was thought that it would be a pity for it to become absorbed into a bigger organization, and that obvious advantages would accrue from loss of its individuality.

Special Correspondence.

BUDAPEST.

Professor Forel on Heredity and Education.

The aged apostle of anti-alcoholism and the sexual enlightenment of senior schoolchildren seems to be fond of Hungary. For a third time Professor Forel has left Switzerland for a European tour, and though he did not intend at first to come to Hungary, his friends in that country persuaded him to change his mind, the result being that he visited Budapest once again, and gave a lecture on heredity to the Medical Society. His lecture commenced with a dissertation upon the theory of heredity, the laws of which, in his opinion, are precisely the same as the laws of all organic life. Heredity is not merely the mutual action of the qualities possessed by both parents, but a process which began hundreds of thousands of years ago, which continues to-day, and which will continue as long as there is organic life in this world. The life of every one of us at this present moment is nothing more than the result of lives which were over and done years before we came into being. If we seek the traces of these former existences which have had such an influence upon ours, we find a mighty library wherein we can trace their every detail. This library is simply the whole earth, each layer of which is a page, the words thereof consisting of the relics we find there—skeletons, fossils, stones, etc. The human body is made up of millions of cells. Our bodies do not differ very greatly from those of animals; it is only the brain of the human being that separates him from the brutes. The progress of biology and natural history enables us to speak with certainty of the general affinity of all living things, and affinity which exists through our common ancestors. It is true that the original races and their various offshoots have become widely different during the course of ages, but this is owing to external influences. For instance, suppose a lady of Budapest marries a negro, and has by him two children. These children may be as utterly unlike each other as if they belonged to two separate families in different hemispheres. One child may be white, like his mother, but with curly hair, flat nose, and blubber lips; the other might be a mulatto, with a finely-cut Greek nose and the lips of a European. Thus, in spite of the tie of blood between them, it is possible for the children of such parents to differ greatly from one another. Consequently, it is an axiom of eternal truth that Darwin gave us when he said that the different races have been in process of formation for thousands of years. Even at the present time there are new developments in the process of formation. For example, in Hagenbeck's zoological garden at Hamburg, a successful experiment was made by mating a lion with a tiger; the result was that one of their two cubs was a cross between a lion and a tiger. From this a new breed has been established. Though the mule has been known for 3,000 years, mankind did not recognize this great fact of natural history in its full completeness. The mating of dogs with cats was tried for a long time, but without success. This proves, therefore, that they are not akin, though no one can deny their organic affinity. Their skeletons resemble each other very closely; they possess the same organs; whilst their mode of life and even of reproduction is so alike as to be almost identical. Cats, also, are not akin to mice, though more features in common can be found between these two classes of animal than between cats and birds. No affinity whatever has ever been found between the feline and the feathered race. One could go on in this way till it came to

comparing the cat with the butterfly, etc., and it would still be possible to find some feature common to all living things, whether cat, butterfly, or microbe. All these different species owe their existence to the desire of life inherent in every living creature, and their endeavours to maintain it in spite of the dangers and difficulties encountered at every step. The biogenetic law of Haeckel proves that all animals originate from one common root. Haeckel regards the womb as the book in which the history of evolution is written. From the moment of conception the embryo goes through every stage of that development, which it has taken the human race it may be as much as half a million years to accomplish. At the time of conception the human being is a two-celled being, one on the father's and one on the mother's side; but after a few hours these two cells fall into two parts and begin their propagation. This state of the two cells is the most ancient form of human life, and what goes on the womb is the development of the human species. Some three hundred thousand years ago man was just like the three months old embryo: magnify this seven or eight times, and we get the atavistic man, who has reached his present form only after continued and continual evolution. When the uterine embryo reaches that stage of development which corresponds to the state of development of present-day mankind it is born. Now, if we examine the development of the eggs of fish or salamander, and the ova of the bear, ape, or hare, we see plainly that at a certain stage of development it is quite impossible not to recognize the affinity. But if that is so—and present-day science has proved the truth of it—then it is clear that heredity has its origin in infinity, rather than in the mutual action of the parents. The cells from which we originate bring into our organism the universal forces of those cells from which they themselves evolved, and in their turn the same process of heredity had been gone through by these latter. Experiments have been made to find out what changes can be brought about on the single formation of cells by external influences; and by these means it has been proved that the cells in themselves are susceptible to external influences, and this susceptibility is transmitted from cell to cell as a latent energy. This energy enters, either wholly or in part, into those cells which are united. The truth of this statement is illustrated in a striking manner by the manifestation in a child of qualities inherited from his parents or very often from ancestors of five or six generations earlier. It is seldom that characteristics are inherited from any earlier generation, say the seventieth or two-hundredth; but it sometimes occurs, and this is atavism—the resurrection of the ancestor. Forel then spoke of the present system of education, which he regards as harmful from a morphological point of view, and which, in his opinion, never seems to accomplish its real object. The present school system, he says, which overburdens but does not develop the brain of the child, will have to be abandoned, and the modern school must be run on quite different lines. It is only in this way that the evil tendencies of heredity can be checked in our children, and in the course of a generation or two be overthrown and completely stamped out.

THE next meeting of the Society for the Study of Inebriety will be held in the rooms of the Medical Society of London, 11, Chandos Street, Cavendish Square, W., on Tuesday, October 11th, at 4 p.m., when Mr. John Newton, Secretary of the United Committee for the Prevention of the Demoralization of Native Races by the Liquor Traffic, will open a discussion on Alcohol and Primitive Races. Each member and associate is at liberty to introduce a visitor.

THE Lettsomian Lectures will be delivered in the rooms of the Medical Society of London on February 6th and 20th and March 6th, 1911, by William F. Haslam, F.R.C.S., on a Review of the Operations for Stone in the Male Bladder. The anniversary dinner will take place at the Whitehall Rooms, Hotel Métropole, on Wednesday, March 8th, 1911, at 7.30 p.m.

Correspondence.

THE MIDDLESEX HOSPITAL.

SIR,—I am happy to be able to inform you that I have now received the £20,000 I asked for to enable me to remove the debt from the Middlesex Hospital, a generous friend, who desires to remain anonymous, having just handed me a cheque for £231 in order to complete that sum.

I find some difficulty in suitably expressing the deep sense of gratitude I feel towards all those who have so loyally responded to my appeal on behalf of an institution in whose activities they have now shown, by their practical sympathy, the highest confidence and appreciation.

Rich and poor alike have contributed to the success of my effort, for the sums I have received range from one thousand guineas to threepence. It has afforded me the greatest gratification to observe the generosity of those who owe their present freedom from disease or relief from pain to the hospital's kindly influence, and I venture to say that no stronger proof could be found of the value of this ancient charity than that those who were once under its care should have come forward, cheerfully and often with much self-sacrifice, to share its burden in its hour of need.

To each and every contributor I once again offer my sincerest thanks, and I also take this opportunity gratefully to acknowledge my indebtedness to the press for the valuable assistance they have afforded me by bringing the needs of the hospital prominently before their readers.

But my task is not yet finished. The debt of £20,000 has, it is true, been removed, but that liability represented the accumulated deficits between income and expenditure for three years, and from this it is obvious that, until a steady and permanent addition of £7,000 per annum is made to the hospital's income, its financial position is not secure, and every third year the Governors will find themselves face to face with a crisis similar to that which has now happily been averted.

It is my ambition to substitute, for such a hand-to-mouth administration as this, one which will provide the Governors with an income sufficient to meet the normal expenses of the year, so that they may apply themselves solely to seeing that it is expended to the best advantage in the interests of those whom the hospital serves, and, directly I am able to do so, it is my intention to devote my time and energy to building up an adequate annual subscription and donation list. I feel sure that my confidence in the generosity of those to whom I apply will again be fully justified.—I am, etc.,

FRANCIS OF TECK,
Chairman of the Weekly Board of Governors.

Middlesex Hospital, Sept. 25th.

CORONERS' LAW AND DEATH CERTIFICATION BILL.

SIR,—I have read the correspondence under the above heading, and am surprised that so few practitioners have expressed themselves, and those so mildly. As "A Country G. P." says, "It will be indeed iniquitous if we are to be burdened in the public interest without adequate remuneration." Much outcry has been made, and quite rightly, against the Births Notification Act, yet what does it involve? Just filling up a postcard in regard to a visit already made; whereas the proposed enactment will frequently require a journey over rough roads or no roads at all, for a distance of anything up to ten miles and back, in any weather, and however busy one may be with paying patients. Such a journey when snow is deep may well occupy half a day, and be ill paid at a guinea; yet, forsooth, we are to go for nothing, and have as solace the reflection that the journey has not been and could not be of the smallest benefit to a single creature. It is said that "we are out for fees." Personally I have not the smallest desire for such journeys at any fee; but if I have to make absurd expeditions to satisfy a few nervous faddists, I see no reason why I should not be paid for them, and adequately, too. Dr. Humphrey Davy's suggestion to charge the ordinary visiting fee will not do at all. It is just the

people who pay nothing or wholly inadequately, and who live in out-of-the-way places where no good-class patients would abide, for whom these corpse-viewing expeditions would most often have to be made. There should be a fixed fee, and mileage extra, with special addition for places to which there are no proper roads. There is just now much outcry all over the country about "the land tax," passed presumably in the public interest. It seems generally agreed that legal assistance is necessary in order to fill up Form IV, and yet we must suppose that it is to the public interest that it should be filled. Why, then, are not lawyers compelled to give gratuitously this assistance and to travel many miles to their clients' houses for the purpose? Because they are not such fools as to submit to nonsense of this kind; on the contrary, they are reaping a rich harvest. Why are we to be compelled to do our professional work for nothing? Solely because the public consider that we are fools enough to do it. Let us for once show that we are not quite so silly as they think.

I would suggest that country practitioners everywhere combine to write to their members of Parliament, stating the plain meaning of the proposed legislation as it will affect them, and their determination to resist it. If only we can combine we cannot fail, and not only will this gross injustice be prevented, but our legislators will receive a much-needed lesson, which will be of incalculable benefit to the profession in the near future, when Poor Law reform and similar measures come to be considered.—I am, etc.,

September 26th. ANOTHER COUNTRY G. P.

SANATORIUM TREATMENT OF TUBERCULOSIS.

SIR,—Although tempted to answer at length some of the points raised in Professor Pearson's last letter in the JOURNAL of September 24th, I do not think you would thank me for so far trespassing upon your space; you will probably agree that to continue this correspondence would serve no useful purpose. May I, however, before quitting the subject, give expression to the thought which has been uppermost in my mind throughout this discussion? My anxiety is, lest the provision of sanatoriums for the poor should suffer a serious check owing to unfavourable criticisms levelled from time to time at sanatorium treatment and its results. Those institutions, like our own, which have been established for some years, and whose work is well known and fully appreciated, can well take care of themselves, but there are at the present time, throughout the country, many districts anxiously debating whether they shall establish sanatoriums for their consumptive poor. If any such districts should be deterred from taking up the work in consequence of such criticisms, I should regard it as a matter for profound regret. Those who discourage the provision of sanatoriums, unless they do so with the strongest possible evidence to back them up, naturally incur a grave responsibility. All I ask for is a judicious reticence on the part of the sceptical.

The matter may be fairly summed up as follows. The encouragement of sanatoriums can only be productive of good. Even should they fail to realize to the full the expectations formed as to their curative value, they still remain as a great educational force, and if no longer used for consumption would form excellent convalescent homes. On the other hand, the discouragement of sanatoriums would be doing a serious injury to the consumptive poor of this country, if any value at all is to be attached to the opinion of those who have made this subject their special study.

Thanking you for your courtesy in allowing space for so much correspondence.—I am, etc.,

Kirkby Lonsdale, Sept. 26th. WM. S. PAGET-TOMLINSON.

SIR,—We all recognize and highly appreciate the great service Professor Karl Pearson has rendered to medicine by his clear and very important contributions to the discussion on sanatorium treatment. It is, therefore, with great regret that I see, in his letter to the BRITISH MEDICAL JOURNAL of September 24th, he lends the support of his great authority to the theory that "the constitution liable to tuberculosis is inherited." That is, indeed, an old and something more than "verbally inaccurate" view, for it is untenable. Statistics of the *post-mortem* examination of children at and shortly after birth do not afford any evidence in its support, and the statistics to which Professor Karl Pearson refers do not allow for the factors of environment and the reactions it calls forth, factors that are in themselves known to produce a constitution liable to tuberculosis and something more.

Professor Klebs of Heidelberg, in his Croonian Lecture on Alterations of the Development and Forms of Plants as a Result of Environment, referred to in the BRITISH MEDICAL JOURNAL of June 4th, shows the great part environment takes in the phenomena of life, and that by ascertaining the conditions under which the phenomena are produced and applying that knowledge, we can produce those phenomena at will. In 1887 I read a paper at the meeting of the British Association on the Experimental Production of Chest Types in Man, in which I showed that after birth the type of chest in man solely depended upon the conditions to which it was subjected, and could be produced at will by submitting it to the conditions that produce that type; and I subsequently demonstrated at the Polytechnic the practicability of applying that knowledge in ordinary life. Environment and the reactions it calls forth have long been employed, under various names and in a vague and general manner, in the presanatorium treatment of tuberculosis. Definite application of the knowledge of man's environment and his reactions thereto, and the due consideration of *all* the factors in the case, give effective treatment in phthisis. That fact I have personally experienced and seen in other cases, and I hoped to have brought it before the recent meeting of the Association, but, to my great regret, I was informed that time did not permit.—I am, etc.,

London, E.C., Sept. 24th. GODFREY W. HAMBLETON.

DEGREES IN DENTAL SURGERY.

SIR,—I hoped that some official would call attention to an omission, with regard to dental degrees, that was made in your Educational Number.

During the present year the University of London has dealt with the problem, so that for the future any student who is M.B., B.S.Lond., can upon completion of a prescribed curriculum present himself for the "M.S. in Dental Surgery."

This is in keeping with the regulations for the M.D., which for some years has been divided into many branches of medicine at the option of the candidate.

By this arrangement the ambitious dental student is provided with a degree in dentistry worthy of his abilities, and has the advantage of allowing him a place on both the medical and dental registers.

Although this is the first branch formed in the M.S., it is to be hoped that the gynaecologists, the ophthalmologists, and the laryngologists will apply to the Senate of the University for similar arrangements for their respective specialities in order that the public and the profession may be in a position to select those who by the possession of this degree show they have had special education and examination in their special department, which is not provided at present by either degrees or diplomas.—I am, etc.,

London, W., Sept. 25th. MORTON SMALE.

*** Mr. Morton Smale does not seem to have read the issue which he criticizes with sufficient care. So far from the possibility to which he alluded having been overlooked, reference to it was made on p. 679, and the fashion in which a B.S.Lond. may proceed to the mastership via dental work was set forth fully on p. 680.

THE USES AND DANGERS OF TEETH AND PROSTHETIC APPLIANCES.

SIR,—Your article on dental surgery on p. 800 of your issue of September 17th encourages me to trespass on your courtesy in an attempt to remove the misapprehension which I find exists as to my views on the uses of teeth and the abuse of prosthetic appliances. Referring to my paper, published in the same issue, on the value of teeth to the human economy, you were kind enough to accuse me of "humour and common sense." In many quarters I am accused of humour only, and sorry humour at that, in having sustained before a learned society so self-evident a fallacy as "that a man can fare just as well under present-day conditions of civilization in the edentulous as in the fully dentulous condition." This thesis you have found to be based on common sense—it is, indeed, based on observed fact—and I am very content to be able to leave it at that. I should like, however, to

point out why I hold the right appreciation of this thesis—that the edentulous need have no fears for their nutrition—of such importance.

The main reason lies in the single word "sepsis." At any period and in any class of life, once the mouth has become septic it is very difficult to regain and maintain even the state of unstable asepsis which we accept as clean. In hospital practice, after many years' experience, I find it impossible with practically cent. per cent. of the patients. By persistent treatment asepsis may have been reached, but relapse occurs in a very short time—the more surely the more teeth there are present. Moreover, cases which have been pronounced clean may often be shown to be hotbeds of sepsis owing to accumulations of germs and débris in unsuspected pockets alongside apparently healthy teeth. It may be asserted that among hospital patients of any age the state of oral cleanliness once lost is practically impossible of re-establishment except by wholesale extraction.

A second reason, equally cogent but practically swamped by the first, is that the efforts of all the dentists in the kingdom would be insufficient to cope with the conservative and prosthetic needs of the poor—scaling, filling, treatment of pyorrhœa alveolaris, making of artificial dentures.

Extraction of children's teeth merits special notice. Sepsis of a temporary tooth often determines a spreading inflammation, which kills the developing tooth of succession before it ever erupts, or so injures it that it falls a prey to caries immediately on its eruption; extraction of septic teeth eventuates in a clean mouth, into which the remaining permanent teeth may erupt, and with intelligent supervision the child may be induced to maintain this state of cleanliness indefinitely. Conservative work (fillings) will be badly done, since children are apprehensive and intolerant of pain, and recurrence of caries around the fillings inserted is inevitable.

When, however, circumstances are favourable, I need hardly proclaim my opposition to ruthless extraction. I believe, indeed, I was the first to offer a systematized explanation of the injury done to the permanent dental arch by early extraction of teeth. My second point—abuse of prosthetic appliances—depends again on sepsis. Tooth plates, unless cleaned beyond what is common practice, are themselves septic; often their very construction renders them uncleansable. Their septicity is evidenced by the decay of teeth at the points of contact between teeth and plate, and by the inflamed state of the mucous membrane underlying the plate whereby the area of the plate is often accurately delineated. Gold caps, crowns, and bridges lie under the same ban of sepsis. In my opinion the fashioning in the mouth of the perfect join passes the skill of man. The perfect join is a flush end-to-end join; there should be no overlap of the crown beyond the edge of the root, and to ensure accessibility for cleanliness the join should be as remote as possible from the gum. The rest of the apparatus, crown or bridge, should be so designed that every part is accessible for cleansing, avoiding all receding angles and concave surfaces. Practically all the specimens of crowns and bridges I have seen have been the merest travesties of these principles of asepsis.

In the very nature of things the most perfect collar join—the form most frequently used—leaves a minute overlap, and in practice this overlap varies up to $\frac{1}{8}$ in.; end-to-end joins are made equally irregular, and both forms are thrust up under the gum out of sight and out of mind. Inaccessible stagnation follows, resulting in caries both of the tooth or root supporting the crown or bridge and of the neighbouring teeth, in tissue infection and destruction producing pockets filled with germs, putrefying débris and pus, and in the local and general results of septic absorption. To all this must be added the dirt that stagnates on the inaccessible parts of the apparatus itself.

The basis of mouth hygiene is avoidance of stagnation; every prosthetic appliance introduces a possibility of stagnation, and its use is of the nature of a compromise in which the claims of beauty and necessity of tooth mastication are weighed against those of cleanliness. Far too often, and especially so in the case of crowns, gold caps, and bridge work, cleanliness finds no place in the final settlement.—I am, etc.,

London, Sept. 27th. J. G. TURNER.

SICKNESS AND INVALIDITY INSURANCE.

SIR,—A cloud no bigger than a man's hand in an otherwise cloudless sky is often very disconcerting to the traveller who is far from his destination, and who has not an umbrella with him.

So Professor Moore's letter reads like the cloudless sky, full of promise of glorious weather for the profession; but alas! the cloud appears in what appears to me to be the all-important passage in his communication, "It is certain there would be some small ups and downs in income inevitable."

Most of us will agree with the certainty; some of us may disagree with the estimation of the ups and downs being small.

I congratulate Professor Moore, who has escaped these ups and downs, and who is in the happy and enviable position of being the possessor of an assured income.

Experience in worldly matters has frequently taught us that human prophets are very fallible. We still remember that during the South African war there were plenty of military prophets who prophesied a three months' campaign. There were prophets who told us at the time of introduction of the Midwives Bill that our interests were safe, and that only cases which the medical man would prefer to leave alone would seek the assistance of a midwife. Experience has proved to many the falseness of his prophecy.

And after all Professor Moore can only express his pious opinion upon the subject.

The Government bill has not yet been introduced. There is even a possibility that it may not run on the lines drawn out by Professor Moore—that he has reckoned without his host.

However, from past experience—Midwives Act, Inspection and Treatment of School Children Act—we may assume that the interests of the medical profession will not be unduly emphasized. This experience will lead any thinking medical man who has experience in private practice to regard any proposal of the Government affecting his interests with suspicion.—I am, etc.,

Bedford, Sept. 27th. S. J. ROSS.

SPIRITUAL HEALING AND THE "GUILD OF HEALTH."

SIR,—I am anxious to convince your readers, even if I am unfortunately not able to convince Dr. Bousfield, that the Guild of Health is a perfectly sane body of people whose position and aims have been seriously misrepresented in your columns, and that the charges against myself personally and my action in a particular case were unfounded. Any one who has followed this correspondence will observe that Dr. Bousfield continues to assert what I have repeatedly denied—namely, that I act "independently of medical control." I must repeat, therefore, once more that I do nothing of the kind, and I unhesitatingly assert that no sane man could attempt to take such a responsibility. To justify myself in the case referred to, I must add that when the lady in question first came to me she told me she was not then under any doctor, that she had been to many but that there was no treatment of any kind, and that the last time she had seen a doctor she was told that nothing more could be done for her. Under the circumstances, I did the only thing I could do. I consulted a medical friend of mine, who told me all that is, I believe, known about the disease. If I had been told that Dr. Bousfield was her doctor, I would certainly have communicated with him. I do not know what difference it would have made or what "medical control" he would have exercised. The point is simply this, that I am just as opposed as any of your readers could possibly be to any one attempting to heal by any means whatever who is not himself qualified or is acting in co-operation with some one who is qualified.

As far as the guild is concerned, I am glad Dr. Bousfield should quote all or any of the memorandum which sets forth its position and aims. He need not "prove" that the guild believes that there is such a thing as spiritual healing and desires to see it restored. That is the explicit object of the guild's existence, and it would welcome the co-operation of Dr. Bousfield or any other doctor who would help forward that restoration on wise lines and with proper safeguards. We do not—let me repeat once more—

exist to "put you in the way to obtain spiritual healing," but to study this difficult subject and to forward the revival of spiritual healing on the sanest and best lines.

Dr. Buttar's letter opens a larger question. I pass over his initial paragraph, because it is wanting both in good taste and in accuracy. He asks me to define the limits of spiritual healing. Of course I cannot; neither can he. We would agree, I imagine, that there are mental and spiritual forces available for the cure of disease. But if he will read again the original articles that appeared in your pages, he will find how impossible it is to define their "effective range." I cannot accept "J. W. T.'s" limit of hysteria, or the difference between organic and functional disease, as we are continually being told on the highest medical authority that the distinction is invalid. Of course there are limitations to spiritual healing as there are to every subjective method, and it is part of this difficult problem to define them. For the present I ask Dr. Buttar to agree to the general statement that inasmuch as there is in every case of illness a subjective element, which in some cases is even the dominant factor, mental, and still more spiritual, forces may be operative in contributing to the case. From that point we can get to work and discuss sympathetically the form in which, the conditions under which that contribution can be most effectively employed, the range and limits of its usefulness, the protection of the public, and a dozen other questions that can only be solved by the united endeavours of those who represent religion and medicine.—I am, etc.,

FRANCIS BOYD,
Warden of the Guild of Health.

Clifton, Sept. 25th.

THE CATHOLIC CHURCH AND THE LOURDES CURES.

SIR,—In the article with this title, published in your issue of August 20th, Abbot Gasquet states:

> The supernatural character of facts alleged as miracles is tested by every possible means, the evidence is sifted with minute care, and facts reputed to be miraculous are rejected which do not fully stand the requisite tests.

Further on the abbot adds:

> What is true of the attitude of the authorities of the Roman Congregation towards alleged miraculous facts is true in regard to what are known as Lourdes miracles.

In the case of a patient who was under my care and observation, and who is entered among the list of cures miraculously effected at Lourdes, the conditions mentioned were not fulfilled.

This patient, a woman, S. A., was in 1895 in bed with functional paralysis of the legs, and she was under my care till the time she went to France. One day the patient informed me that through the kind assistance of friends, among whom was Lady Margaret Howard, she was to be taken to Lourdes.

She had no certificate from me that the disease was incurable; but I was informed later that such written testimony had been given by a doctor under whose care the patient had been previously to my acquaintance with her. Result a cure, and the patient walked again.

Subsequently I was asked to give my opinion, with a view, I understood, to publication; and as in conversation misconceptions arise, I asked permission to submit my observations in writing.

In my memorandum, besides giving my own view, I mentioned the fact that this patient had been in two London hospitals, and that the records of those institutions should be referred to, and the opinions of the able men under whose care the patient had been could be ascertained. This manuscript I sent, but it was returned to me without any note or comment. But a little later a representative of the *Pall Mall Gazette* called and said that in the *Tablet* my name had been given as testifying to the miraculous nature of the cure. I verified the information, and my name had been unwarrantably used. In the face of these facts one cannot agree with the learned prelate that—to quote him for the last time—"the utmost care is taken to secure the full medical history of the patient."—I am, etc.,

HENRY H. STURGE.

London, W., Sept. 26th.

SHIP SURGEONS.

SIR,—Dr. Rentoul's letter on this subject, in your issue of September 24th, is very much to the point, and worthy of the notice of every ship surgeon. The facts which he mentions concerning Liverpool are interesting, the more so as these conditions relating to the official recognition of fees do not obtain, as far as I am aware, anywhere else; indeed, your correspondent had, in common with his colleagues in one of the largest lines, to sign a declaration that he would not charge or expect to receive fees from passengers. This was some years ago, certainly; but things at sea change slowly, and doubtless, as far as this particular line is concerned, surgeons still conform to the regulation. I travelled home on an Austrian liner from Natal some years ago, but was not aware that any such official notice granting permission to charge was placed in the saloon. The exhibition of such a notice is hardly consistent with our ideas of professional dignity, and the further provision by some British shipping companies empowering captains to form a court of appeal in the (not unusual) event of a passenger objecting to his bill for medical attendance, also goes to prove that it would be well if some measures of reform were introduced into the system that at present governs the seagoing branch of the profession.

Steamships are sailing almost daily from English ports bringing across the Atlantic immense numbers of passengers, some of the big boats carrying close on 3,000 souls, and the medical care of these people must be a great tax upon the time and thought of the ship surgeon who has, practically unaided, to look after what ashore would be considered a very fair practice with its accompanying advantages.

It is to be hoped that Dr. Rentoul's plain speaking will have effect, and that ship surgeons will now accept the chance which offers of combination. All communications will be answered by myself or the members of the provisional committee formed for the purpose of organizing a movement amongst the members of the marine branch of the profession.—I am, etc,

JOHN F. ELLIOTT,
Acting Secretary Subcommittee Medico-Political Committee, British Medical Association.

Rostrevor, co. Down, Ireland, Sept. 24th.

THE INTERNATIONAL HYGIENE EXHIBITION.

SIR,—I note with satisfaction your remarks as to the action of the Government with regard to the International Hygiene Exhibition at Dresden.

It is, to say the least of it, remarkable and significant that a Radical Government, supposed to have the welfare of the people so much at heart, should ignore every opportunity of this sort.

It may interest you to hear that, for the recent Congress of School Hygiene, held in Paris, three official delegates were appointed by the same Government. They were strictly enjoined to hold their tongues and not to speak at any of the meetings. Only one of them attended the Congress, and he carried out the policy of silence entrusted to him with singular ability. Therefore, at an opening meeting, where were heard speeches from official delegates from every country in the world, including obscure South American States, there was no word whatever from any representative or delegate from Great Britain, save, of course, that Sir Lauder Brunton spoke, in his non-political capacity as retiring president of the preceding Congress.

No doubt this policy is consistent with that displayed in 1907, when the Government did its best to wreck the second School Hygiene Congress.—I am, etc.,

INDIGNANT BRITON.

September 24th.

THE USE OF IODINE SOLUTIONS FOR ANTISEPTIC PURPOSES.

SIR,—With many surgeons a practice has recently come into vogue of using iodine for antiseptic purposes. It is always interesting to recall how practices periodically repeat themselves, and how probably this particular one had its origin in the pre-Listerian days. It was within my memory that, as a student at Guy's Hospital, Mr. Thomas Bryant was using iodine solutions at the time when carbolic acid solutions were being introduced by Lister, and being very generally employed by all who were then

following his methods. To make sure that my memory served me truly, I wrote to Mr. Bryant on the subject; and received the following reply which I think may interest many who have revived this old custom.

Kensington, W.,
September 23rd, 1910.

My dear Maylard,

You are quite right in saying that the use of the solutions of iodine in surgical antiseptics was generally employed by me in 1876 in the treatment of all wounds and most operations, but not in the way you mention—by the local application of the solution of iodine to the skin of the part preparatory to operation. If you will refer to the fourth edition of my book on *Surgery*, published in 1884, vol. i, when Lister's splendid work was first introduced, you will find on pages 23-24 that I had adopted the use of iodine five or six years before, and I may add have adhered to its use with some small modifications up to 1908 when I retired from practice—a period of forty years. I was led to use iodine as an antiseptic from having acted as dresser to Mr. Aston Key in 1850, when Guy's, with all the London hospitals, had a plague of hospital gangrene; and Mr. Key allowed his dressers who had charge of those cases to use the local application they thought to be the best. I selected iodine; and I say now that the results obtained in the treatment of gangrene were better with iodine than with any other drug.

Upon this experience, acquired twenty-seven years before, in 1850, the use of iodine as an antiseptic for general purposes naturally came before me in 1872; and I am pleased to express the opinion, after forty years' experience, that it is without doubt the best antiseptic drug surgeons of the present day possess.

Among its other advantages, iodine in the form of a solution can always be obtained in any chemist's shop. The lotion may be used as a spray or otherwise, with or without a sponge. As an antiseptic it is excellent, and when warm has a marked tendency to arrest capillary bleeding or oozing. I have always made the iodine lotion by adding its strong solution to water to render it of a light sherry colour, and in septic cases I make the solution of a darker colour. In recent years, in cases of bad compound fractures and septic wounds, I have used iodine in the form of iodol, finely powdered, with boracic acid in equal parts, dusting the wound inside as well as outside with the powder before it is finally closed and dressed, using a dry dressing of some antiseptic gauze to cover the whole. Under this treatment my results have been very good—my dressers used to say that they were better than my colleagues'—but I am satisfied with saying that they have been good. I should like to add that I have used in all my cases torsion of the arteries, which may have done much to bring out the good result.

With kindest regards,
Sincerely yours,
T. BRYANT.

I am, etc.,

Glasgow, Sept. 26th. A. ERNEST MAYLARD.

A CAUSE OF DEATH AFTER OPERATION FOR APPENDICITIS.

SIR,—I am sorry I should have misunderstood Mr. Brown, but on re-reading his paper I must say I think the meaning I attributed to his words was the obvious one. Mr. Brown says:

> I believe this lymph acts as a filter, allowing soluble toxins to pass through into the lymphatics and blood stream of the surrounding viscera, but presenting a barrier to the passage of the bacilli, like the porcelain of a Berkefeld filter.

This certainly seems to me to express the idea that the bacilli are harmful apart from the toxins they produce, for even while the lymph is there, Mr. Brown says, toxins are passing into the blood and lymph stream. But Mr. Brown tells us that that is not what he meant, but rather that more toxin would be produced if the organisms themselves gained entrance to the circulation. He, however, admits that he has no evidence that when these symptoms of grave toxaemia come on after an operation for appendicitis organisms are multiplying in the blood stream. He says he has never examined the blood for organisms. The fact that perhaps many hours may elapse between the time of the operation and the onset of the symptoms seems to me an insufficient reason for regarding the process rather as a septicaemia than toxaemia from the suppurating area. It is very likely that the time of the onset of symptoms depends largely on the rate of absorption of the toxins, for until a sufficient dose had been absorbed symptoms would not arise.

I mentioned the two cases of death with symptoms of toxaemia after removal of a gangrenous appendix, without suppuration, to show that these grave toxic symptoms may arise when there is no question of the removal of a layer of protective lymph lining an abscess, and therefore that Mr. Brown's theory that they are due to such removal does not cover all the facts. One of these cases is really most instructive. The source of toxic poisoning—the gangrenous appendix wrapped up in omentum—was removed at the operation, and there was no infecting area left behind, and yet the girl died in twelve hours with symptoms of profound toxaemia. It seems to me that probably some toxin had entered the circulation before the operation, but not in sufficient dose to cause serious symptoms, but that the anaesthetic increased its virulence so that it became very rapidly lethal in its action. I have now abandoned the use of chloroform in all cases of acute appendicitis in children, and they have ether by the open method, as most cases of delayed anaesthetic poisoning have been after the administration of chloroform, and the symptoms of toxaemia following operation for acute appendicitis are very similar.

Mr. Brown says that in the four instances I gave in which symptoms of toxaemia followed the evacuation of an appendix abscess at the end of a week from the onset of the symptoms, I have no evidence that the abscess had been present all the time. That is quite true. But I quote the cases to show that if we wait for a week after the onset of the disease, we do not necessarily avoid the occurrence of toxaemia after operation. Mr. Brown himself says: "When a definite abscess has formed, wait until after the first week; when about ten days have elapsed it is probable protection will be complete." Now, surely, he means the first week of the disease, for who shall say on what day suppuration actually started, the difficulty rather is to tell if it is present at all, in fairly early cases. Therefore, I say, that even a week after the onset of symptoms, death from toxaemia may occur after operation. The lesson which I think this teaches us is that it is useless to wait for a week, as Mr. Brown advises, as a safeguard against toxic poisoning when the operation is performed. I feel sure that as soon as pus is present the patient's greatest chance of recovery lies in its speedy evacuation.—I am, etc.,

Bristol, Sept. 24th. CHARLES A. MORTON.

MECHANO-THERAPY.

SIR,—I have more than once been on the point of sending you a note upon this subject, and Dr. Bryce's excellent article in the issue of September 3rd has decided me to do so. The previous impulse to write you was supplied by my own observation and that of others here in connexion with osteopathy, which, however, affects the writer personally not at all. I have several times before a local medical society insisted on the grave error of the medical profession in neglecting mechano-therapy—an error made the more glaring by the very remarkable commercial success of the osteopath, into whose hands at one time or another fall, it might not be too much to say, the majority of well-to-do Americans. These patients are generally eager in their support of a system whose basic theories are even more ridiculous than their practice may be beneficial. To this active voluntary support on the part of the "best" people is due the universal (I believe) success of the osteopath in obtaining legal recognition. In order that the British people (who themselves, as the history of bonesetting proves, are not above supporting irregularity in medicine) may obtain the benefits of mechano-therapy without the very real dangers—such as rupture of an appendical abscess—of falling into the hands of the osteopath, one of two things appears necessary; either British medical men must themselves undertake to supply mechano therapy, or widely-trained masseurs must be more commonly employed by them. Now, there can be no doubt that one reason which operates against the more frequent prescription of such treatment is that it may to a considerable extent remove the patient from the surveillance of the medical profession. But is that necessary? Is there anything derogatory in doctors including mechano-therapeutics among their own personal methods? Is such work less worthy of the educated doctor than much of the routine of general practice? One may doubt it. One's experience of the work of persons who devote themselves to an individual cure-all seems to prove that so-called osteopathic, balneological, and dietetic treatments, when carried on under favourable circumstances, very frequently re-establish health after the family physician, who has not used one or all of these, has ignominiously failed. Such methods have been long

established as sound treatment, and have fallen too generally into the hands of ignorant and sometimes immoral practitioners only because scientific men have neglected them. There is a wide and useful field of employment, especially for the younger members of the profession, in at least directing such work, should it be considered insufficiently dignified for their own hands. It would appear that, besides home treatment, there is in Great Britain room for scores of institutions in which such methods might be carried on, and that the people and the profession alike would greatly benefit from them, because in them there would be no divorce between the prescription of drugs, etc., and the really scientific use of active and passive exercise, baths, and so on. Certain friends of mine now have such an institution operating with great success. Such institutions might be enhanced in scientific interest in the eyes of the profession, and prove of increased value to the public, if they were fitted up for the examination of the dejecta, of test breakfasts, pathological specimens, and so on. As patients frequently need not be resident within such institutions many people would be willing to visit them merely for treatment who would not care to stay away from home for the purpose. Each of the smaller cities, therefore, could probably support one. If the American profession had possessed imagination enough it need never have been in the position of competing with the osteopath, who, when he asks to be legalized blatantly proclaims his entire dissociation from the medical profession, and afterwards may demand the right to sign death certificates, though so far as I know still unsuccessfully. The mere fact that the profession is at present better protected against such as the osteopath in Britain than in America (where, however, the profession's position is improving by leaps and bounds) is no reason for refusing to patients the benefits of a treatment often used by irregular practitioners with marked advantage.—I am, etc.,

Atlanta, Georgia, U.S.A., Sept. 18th. A. W. Stirling, M.D.Edin., D.P.H.Eng.

TREATMENT OF CHOLERA.

Sir,—Professor Leonard Rogers is evidently not a voluminous reader of current medical literature, otherwise he need not be troubling any pharmaceutical firms as to the best form of "putting up" calcium permanganate. Messrs. Allen and Hanbury have for a long time put it up at my suggestion in capsules, being mixed with a paraffin. Messrs. Oppenheimer have also put it up as palatinoids for over two years.

I first of all published a monograph on the drug in 1907; in 1909 there was a short notice of it in the British Medical Journal as to its value in gastritis and *enteritis*. On April 1st, 1910, in the *Journal of Tropical Medicine*, I published its value in malaria, as well as the fact that Allen and Hanbury capsulized it.

In the British Medical Journal for May 14th, 1910, is an article on Calcium Permanganate in Plumbism, on its value being due to its action on the alimentary canal. The *Dublin Journal of Medicine* this month allows me its place of honour, with an article on calcium permanganate.—I am, etc.,

Swansea, Sept. 26th. G. Arbour Stephens.

HOW TO USE THE "JOURNAL."

Sir,—I have read with interest Dr. Carey Coombs's description of his method of "making use of the Journal," and venture to add to it my own experience. Like Dr. Coombs I get rid of the advertisements, but I go further, and get rid also of so much of the matter as I do not wish to preserve. In short I tear out the pages I desire to keep and hand over the remainder to the custody of the waste-paper basket. These pages I then thread on a "perfect" file, having first removed from the file the ledger index supplied with it, and I number the pages in due order with a pagination from right to left. To make serviceable the material thus collected I keep a large folio volume (index volume) and allot in this a page (or pages) to each subject, the reference to the various subjects being entered in a ledger index at the beginning of the book. Then each week, or as often as may be convenient, I enter in the corresponding pages of the index volume the articles filed from the current Journal. Say, for example, these include a paper on pneumothorax: my ledger index tells me that the page in the index volume allotted to this subject is page 300, and I therefore enter on this page the title of the article and the number and page of the file where it is to be found. This procedure only takes a few minutes each week, but if regularly followed secures ready to one's hand all the articles which have appeared on each selected subject during the period of time within which the method has been pursued; and, of course, the more periodicals which are treated in the above fashion the more comprehensive the supply of references. The filing and indexing can readily be undertaken by a dispenser or secretary, and all that the practitioner himself needs to do is to mark the articles which he wishes to preserve; while reference is as simple as turning the pages of a book. At the same time, all untidy and dust-gathering bundles of periodicals are avoided, and the files stand orderly and cleanly on the bookshelves and ready for reference at a moment's notice. There are several helpful details in working this plan which will readily be discovered by any one who adopts it. I will mention one which is distinctly of value: it is to enter in the index volume not only the title of the article and the number of the file in which it is to be found, but to add also a few words indicating its direction or scope. This can readily be done if one starts with a sufficiently large index volume, and particularly if while the left hand pages are made to carry the name of the article the corresponding lines on the right hand pages are reserved for such brief synopses as are here advised. An additional advantage of the method is that while it may be made to include any number of current periodicals it need not be confined to these. Any reference, as from a book or annual publication, may be duly entered on the appropriate page in the index volume with the certainty that its utility will be secured at the very time when the practitioner desires to revive the memory of his reading for some particular end or purpose. I have practised this method of filing and indexing various periodicals for a number of years, and can strongly commend it to any one who wishes to have for ready reference and in compact and manageable form the material which has attracted his interest and attention from week to week.—I am, etc.,

London, W., Sept. 12th. C. O. Hawthorne.

CASE OF VIPER OR ADDER BITE (*VIPERA BERUS*).

Sir,—Referring to the case of snake bite which I reported last year and which appeared in the Journal of August 14th, p. 412, and September 11th, p. 654, 1909, Dr. Peck tells me in the following December (1909) a furrow appeared in all the nails, both hands and feet, and when the furrow reached the end of the fingers and toes the nails broke off at the line of the furrow. This took place in the hands first, the toe-nails breaking off about a fortnight later. I thought with Dr. Peck that this observation might be of interest.—I am, etc.,

Baslow, Derbyshire, Sept. 18th. R. S. C. Edleston.

SECONDARY INFECTION IN PHTHISIS.

Sir,—If Dr. Penn Milton (see British Medical Journal, September 3rd, p. 623) will try the effect of an autogenous vaccine (made from the patient's sputum) in place of or subsequent to an antistaphylococcic or antistreptococcic serum I fancy he will soon see that the vaccine is a preferable means of combating the mixed infections of phthisis.

As regards staphylococcus, Andrews and Gordon have shown that immunity against it almost wholly depends on phagocytosis, which is increased by a vaccine. As regards streptococcic infections Meakin says that immunity from this organism is secured by two agencies, bacteriolysis and phagocytosis, of which the latter is probably the most important.

Pottinger, after treating a number of cases of mixed infection, says:

I do not doubt but that the true remedy will be obtained by a vaccine made from the strain of the particular organism found in each individual patient.

Allan says:

Not only do staphylococci lead to softening and disintegration

of lung tissue but they may also increase the rate of growth of the tubercle bacilli.

It seems to me that no serum (however polyvalent) can possibly give the patient as good a chance as he would get from the use of a vaccine (probably a mixed one) made from the very organisms that are causing his disease; properly dosed he will get the value from each of them if more than one exists.—I am, etc.,

Keynsham, Somerset, Sept. 5th. GEO. WILLETT.

THE HEARING AFTER OTECTOMY.

SIR,—On Saturday last I had occasion to perform otectomy in the case of a married lady who had suffered from an infected ear since childhood. To-day she came to see me, and her first remark was, "Oh, doctor, I can hear with my bad ear; I always thought it was stone-deaf." I said that, although I had not mentioned any probable improvement in the hearing, the fact was not surprising, about 70 per cent. of my cases having improved hearing after otectomy. "But why," went on the patient, "did not any of the other specialists I have consulted tell me something could be done?"

This is a complaint I have heard before from patients.

I could have told her that there is a fashion in surgery as in other things, and that the vogue of the radical mastoid operation has caused a deplorable neglect of intrameatal surgery.

This, however, is not an excuse for those who have advised against otectomy on the ground that it would destroy the hearing—an argument that could with greater truth be brought forward against the radical operation.

I have recently seen four old cases—and four only; all of them report improved hearing.

There is no deafness like that of those who won't hear. It is now a good many years since I first showed cases of recovery from suppurative otitis with improved hearing, but it is the most difficult thing in the world to convince those who wish to think otherwise.—I am, etc.,

London, W., Sept. 21st. F. FAULDER WHITE.

DANGERS OF THE ELECTRIC CURRENT.

SIR,—A common cause of the experiences that Dr. Hubert Pinto-Leite underwent in his bath-room as related in the BRITISH MEDICAL JOURNAL of September 24th (on the happy issue from which he is to be congratulated) is that the metallic cover and other parts of the switch that are designed to be free from the electric current or "insulated" therefrom have by some means come into contact with parts of the switch that are designed to be either charged with or to convey the electric current, or to be, in other words, "live."

This often occurs through carelessness of the workmen in allowing the free ends of the electric wires to be left too long and so touch portions of the switch that they should not, or, as I have found, screws become loose and fall into such a position inside the switch as to form a contact between "live" and "insulated" portions of the switch.

The whole of the "live" and "insulated" metallic portions of the switch are insulated from "earth" by the porcelain base of the switch, and in consequence no test as applied by the electric supply companies or corporations will reveal such a state of affairs as above, and, moreover, the light would in no way be affected.

Whilst standing on a wood floor or a floor covered by linoleum or matting a switch thus defective can be handled with impunity, even with the current at 210 volts pressure; but as soon as this protection is removed, as in the case of standing in a bath which is in free contact with "earth" through the medium of the water pipes, etc., and at the same time the body is well connected electrically with the bath by the water in the bath, a current can easily pass through the body only limited in amount by the resistance of the body electrically, or, in technical terms, the body experiences an "earth shock."

Such shock would in no way affect the light in the lamp, and would occur whether the lamp was alight or not.

The remedy for such a risky state of affairs in bath-rooms or anywhere where a good "earth" contact can be easily made by any person's body is:

1. That all fittings should be made of some non-conducting material—for example, porcelain, vulcanite, etc.—wherever they come into contact with the person.
2. All fittings should be placed far enough distant from any "earthed" body as to prevent the possibility of contact being made.
3. All metallic portions of switches that are not necessarily "live" should be efficiently "earthed."

It would be of interest to know if Dr. Hubert Pinto-Leite found any defects as mentioned above in the switch in question.—I am, etc.,

Portsmouth, Sept. 23rd. GEORGE F. MORLEY, M.R.C.S.

PHTHISIS AND DIABETES.

SIR,—While looking into the family histories of diabetic cases I was much struck by the frequency with which phthisis and diabetes occur in the same family. Leaving out all those cases of phthisis transplanted on diabetic soil, I find in one family four deaths from phthisis and one diabetic. The latter's child died diabetic. Another family three phthisical, one diabetic, and one nephew diabetic, and so on. Knowing that diabetes is caused by altered metabolism, probably deficiency of oxygen, and seeing the results attained by giving oxygen or pure air to phthisical patients, is there not some common factor governing the appearance of the two diseases? In diabetes we have formed a fatty acid—namely, B. oxybutyric acid—on growing tubercle bacilli on certain media a fatty acid has also been produced. Phthisis is decreasing, whilst diabetes is decidedly increasing in number of cases. Is the open-air treatment, with its forced appetite, responsible? Are we trying to strengthen the relatives of phthisical patients and overstraining their powers of metabolism?

I have often noticed the typical strumous complexion, the long eyelashes, and brilliant complexion on delicate skin in many diabetics. Also is there any significance in the appearance of B. oxybutyric acid in the urine in diabetics and the absence of sweating? I believe a small amount of butyric acid is found in normal sweat. At a time when acidosis and its kindred diseases are justly claiming so much attention, I think the discussion of the above points might help in the question of causation, if not prevention.—I am, etc.,

West Southbourne, Hants, Sept. 24th. FRANK C. CLIFFORD.

FEE FOR MEDICAL EXAMINATION FOR INSURANCE.

SIR,—Letters appear from time to time in the JOURNAL relating to the interference of insurance agents with the medical duties of referees. "Clean Hands" returns to this subject in your issue of September 17th, p. 821. This matter is of vital importance to all concerned, involving, as it does, the stability of the insurance companies and the honour and dignity of the profession. Steps should be taken by circularizing the Divisions to find out if such interference is of frequent occurrence. If found necessary, concerted action could then be taken and representations made to the various companies. In my opinion, it is not so much increase in remuneration that is desirable in insurance work as security of tenure, independence of local officials, and that the applicants should be, as far as possible, directed to call on the examiner.

In the city with which I am familiar the Prudential has mapped out a separate district for each medical referee, and favouritism is practically impossible. "Clean Hands" probably goes too far in suggesting that the directors connive at the methods of the agents, but there is no doubt that minor officials demand business at all costs. We can well believe that proposals to checkmate the unscrupulous section of our profession will meet the hearty support of the directorates of companies which transact accident as well as life insurance.—I am, etc.,

September 20th. REFEREE.

POOR LAW BABIES IN LONDON AND BERLIN.

SIR,—May I be allowed to point out that the remarks made in an editorial article of the BRITISH MEDICAL JOURNAL of September 24th in regard to an article of mine in the *Nineteenth Century* do not represent what I stated?

In the first place, the mortality figures I dealt with are not those of the Minority Report, but of the Local Government Board. I quoted the Minority Report, but I made no deductions at all from them. I also pointed out that it was in reply to a question in the House of Commons upon the figures of the Minority Report that a Local Government Board Memorandum was published, giving the mortality statistics of infants under 1 year in the Metropolitan Poor Law institutions; it is these figures which I took. These figures, therefore, are not those of a "heterogeneous collection of ordinary workhouses situated in various parts of England," as stated in your editorial, but are the official figures for the London Poor Law institutions for infants under 1 year. These will include maternity wards and workhouses. In order as far as possible to eliminate the mortality in the maternity wards, with which I was not concerned, I omitted all the figures dealing with the mortality during the first week of life; this, on the statistics given in the Memorandum, worked out at 78.8 per 1,000 (the figure is mine, not Dr. Parsons's, as you appear to suggest).

I further pointed out that the same source of error attaches to the Local Government Board statistics as to the Minority Report, namely, that the figure for the *total number of children born* includes obviously all those born in the workhouse; but the *mortality* figure does not deal with the deaths among all these, but only with that proportion of those born in the infirmary who remain under the infirmary or workhouse and die there. It does not include any of those children who, although born in the workhouse, leave it at any period during the first year of life, and subsequently die outside. Inasmuch as a very large proportion of the children born in the workhouse do not remain there very long, it is evident that 78.8 per 1,000 is an entirely unreliable figure, because it omits all consideration of a large proportion of the children.

For those reasons it is impossible to compare at all accurately the mortality statistics given in the Local Government Board Memorandum with those of the Poor Law children in Berlin, and this I also pointed out in my article. I forbore entirely to make any numerical comparisons for those reasons. It does not seem to me that I can, therefore, be accused of being "unfair to London."

Also, in regard to the unfit children, if my article had been carefully read, it would have been seen that I stated "less than half of all the children who are brought to the Asyl are even approximately normal in size and weight." That is to say, over 50 per cent. of the children are physically inferior. Comparing this with the 21.9 per cent. of physically inferior infants in the Fulham Infirmary, again I hardly think that I can be accused of making statements which are unfair to London.

In conclusion, Sir, it seems to me a pity that such scathing criticism should be passed upon an article when I think I have shown that the statements can scarcely have been carefully read.—I am, etc.,

JANET E. LANE-CLAYPON, M.D., D.Sc.Lond.

London, S.W., Sept. 24th.

Public Health AND POOR LAW MEDICAL SERVICES.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Huddersfield County Borough.—Dr. Samson Moore considers that there is good reason to believe that the population of Huddersfield in 1909 was 103,000, and not 94,740, the estimate of the Registrar-General. He advocates the taking of a census every five years. Based on the latter estimate the birth-rate in 1909 was 24.6 per 1,000 and the death-rate 16.3 per 1,000. The infantile mortality-rate was 96 per 1,000 births. Dr. Moore points out that the gratifying reduction which has taken place in the rate of infantile mortality during the past few years has coincided with the special attention devoted to the subject in Huddersfield. Accommodation has been provided for consumptive patients in a wooden pavilion in the grounds of the infectious diseases hospital. The intention is to retain the patients for six or eight weeks, during which period they will be trained to lead a hygienic life, to appreciate the advantages of an open air life night and day, and to take the necessary steps to protect their relatives, friends, and fellow workmen from the danger of contracting the disease.

BOOKS FOR A PUBLIC HEALTH DEPARTMENT.

DR. PETGRAVE JOHNSON.—The following works might form the nucleus of a small library for a public health department: *Practical Guide to the Public Health Acts*, by Hime (Baillière, Tindall and Cox); *The Public Health Acts* (Knight); *Theory and Practice of Hygiene*, by Notter and Firth (Churchill); *Practical Sanitation*, by Reid and Manley (Griffin); *The Food Inspector's Handbook*, by Vacher (Sanitary Publishing Company); *Food Inspection*, by Macewen (Blackie); *Walley's Meat Inspection* (Green and Sons); *The Purification of Sewage*, by Barwise (Crosby Lockwood); *Vital Statistics*, by Newsholme (Sonnenschein); *The Prevention of Infectious Disease*, by McVail (Macmillan); *Water Supplies*, by Thresh (Rebman); *The Health Officer's Pocket Book*, by E. F. Willoughby (Crosby Lockwood); *The Public Health Acts Amendment Act, 1907*, by Clery and McWalter (Ponsonby); *Housing and Town Planning*, by Willis (Butterworth); *Hygiene and Public Health*, by Whitelegge and Newman (Cassell); *A Handbook of Hygiene*, by A. M. Davies (Griffin); *Sanitary Law and Practice*, by Robertson and Porter (Sanitary Publishing Company. Periodical literature devoted to public health matters includes *The Medical Officer* and *The Sanitary Record* (weekly); *Public Health*; *The Journal of the Royal Sanitary Institute* and *The Journal of the Royal Institute of Public Health* (monthly); *The Journal of Hygiene* and *The British Journal of Tuberculosis* (quarterly): *Transactions of the Epidemiological Society* (annual).

The Services.

THE ST. JOHN AMBULANCE ASSOCIATION IN INDIA.

THE St. John Ambulance Association came into existence in 1877, and about ten years later its work had extended to India. It was not, however, until 1900 that the St. John Ambulance Association in India was organized on a definite basis; at the present time the organization of the Indian branch of the association, specially adapted to the requirements of the country and the constant changes amongst the European residents, is most complete and efficient. This is largely due to the work of Lieutenant-Colonel A. C. Yate, the Honorary Organizing Commissioner for India. The general scheme of organization is based on the peculiarities of life amongst the Europeans in India, where individuals are liable to sudden transfers. The Indian Empire has been divided, for the purpose of ambulance organization under the St. John Ambulance Association, into nineteen areas, and in each, instead of private individuals who may be interested in the work, the local authorities and official heads of the community are *ex officio* the local leaders of the association, the Viceroy being President of the branch.

The "White Book" published by the Indian branch gives particulars of the organization and work of the association in India for the information of those who take an interest in ambulance training. In addition to the necessary information as to the formation and training of classes and other details referring to the work in India, it includes an interesting sketch of the history of the Order of St. John from the eleventh century and of the resuscitation of the English branch of the Order in 1830. The St. John Ambulance Association has done much for ambulance work, and the Indian "White Book," which is now in its second edition, shows that the Indian branch will well maintain the traditions and reputation of the parent association.

BRITISH RED CROSS SOCIETY: SCOTTISH BRANCH.

AN important circular has been issued by the Scottish Red Cross Executive dealing with the recent War Office Amendments regarding the formation of voluntary aid detachments. It is recommended that these amendments should be adopted in connexion with the formation of all new detachments of the Scottish Territorial Red Cross Brigade, leaving it optional for detachments already organized to adopt or not the new formation. In the amendment the composition of the detachments has been much simplified, and the personnel will now be as follows:

(*a*) *Men's Detachment.*—1 commandant; 1 medical officer; 1 quartermaster; 1 pharmacist; 4 section leaders; 48 men, divisible into four sections of 12 men each.

(*b*) *Women's Detachment.*—1 commandant (man or woman), and not necessarily a doctor; 1 quartermaster (man or woman); 1 trained nurse as lady superintendent; 20 women, of whom 4 should be qualified as cooks.

It is recommended that in the case of the men's detachments commandants should, where possible, be ex-officers of any branch of His Majesty's service not liable to be recalled for service. The concession that the commandant of the women's detachment may be a woman and the lady superintendent a trained nurse should assist in the raising of detachments, and by the term "trained nurse" is meant a certificated professional nurse who has undergone three years' training.

With regard to the training of detachments, details were given in the JOURNAL of September 24th, page 919.

The circular also states that the proposal of the War Office that courses of instruction in home nursing can be given by

trained nurses has been very fully considered by the Executive, and they have decided to give their sanction to it, one of the points that has weighed most with them being the fact that in country districts the services of a medical man as lecturer might be difficult to obtain. The recommendation is, however, to have the nursing course given by a medical practitioner wherever it is possible. The examination for the Home Nursing Certificate must be conducted by a medical examiner or matron of a training school. The executive propose shortly to issue a new edition of the regulations for the Scottish Territorial Red Cross Brigade embodying the amendments above referred to. They will also publish from time to time the results obtained in the various counties, so that full credit may be accorded to those counties taking the lead in the Red Cross movement in connexion with home defence.

The circular is issued from the new head quarters of the executive in Glasgow and signed by Major C. C. Fleming, the recently-appointed secretary.

LOWLAND MOUNTED BRIGADE FIELD AMBULANCE.

ADVANTAGE was taken of the autumn holiday in Glasgow on September 26th to have a useful week-end for a number of the non-commissioned officers and men of this unit. Some twenty-five members left Glasgow on Saturday, September 24th, and proceeded by rail to Stirling, where quarters were provided in the Castle by the courtesy of the officer commanding the Argyll and Sutherland Highlanders' dépôt there. Two of the rooms in the ancient royal palace were placed at their disposal. Lieutenant-Colonel Halliday, commanding the unit, was in charge of the party, with Staff Sergeant Jewell, R.A.M.C. On arrival barrack beds and bedding were drawn, cooks, etc., told off, and a most instructive training begun. The men were conducted over the stores by the quartermaster-segeant in charge, and the whole procedure of issuing material on mobilization of special reserve, etc., was explained. Instruction was also afforded in cooking and issue of rations. Monday forenoon was spent in the military hospital, where Lieutenant-Colonel Greig (formerly of the Royal Army Medical Corps), the officer in charge, explained the routine work of the hospital, after which the hospital steward instructed the men in the details of work connected with the pack store, linen store, diets, army forms, etc. The party returned to Glasgow late on Monday evening, after a most profitable and pleasant week-end.

Medico-Legal.

THE WORKMEN'S COMPENSATION ACT.

Place and Method of Examination.

IN our issue for August 13th an account was given of a case in which the main issue tried was whether the solicitor for a claimant to compensation has a right to dictate the time and place at which the claimant shall be examined on behalf of the defendants, and to be present thereat. It was ruled by the county court judge concerned that no such right exists, and that if a plaintiff declines to be examined except in such circumstances, that fact is ground for declining to pay further compensation. In the same issue the general considerations connected with the point were the subject of a short note in another part of the JOURNAL.

Since then another case has been tried of the same general order, and with the same result. As, however, the judge in this case entered somewhat fully into details, his verdict is now given at some length, for, taking the two cases together, they are a useful guide to medical men in their conduct in the matter of such examinations.

The case in question was decided at the Clerkenwell County Court at the beginning of September, when the judge was sitting as arbitrator. It was one in which the applicant for compensation had been admittedly injured during the course of his employment, and had been paid compensation for some months; compensation was then stopped, on the ground that the applicant, without alleging any proper reason for his refusal, declined to be examined by the employer's medical adviser, either at the medical man's house or at the claimant's own house, although the defendants were willing that a medical man should be present at the examination on the claimant's behalf. It was stipulated that the examination must take place at the offices of the claimant's solicitors, and in the presence of a representative of them.

Subsequently in letters, and when the case first came before the notice of the court, the making of this stipulation was supported on the ground that the medical man in question, Dr. Collie, acted with brutality towards workmen in the course of his examination. The solicitors based this charge on information they said they had received from workmen in several cases during a period of four or five years. The kind of brutality complained of was that Dr. Collie called the men shammers, and treated them like dogs. It was also alleged that his use of an electric battery to test the genuineness of a man's alleged sensations occasionally caused unnecessary pain; that his opinions were prejudiced and therefore untrustworthy; that his statements were unreliable and inaccurate; and that on one occasion he had examined a workman without proper notice to the solicitors, and on another had endeavoured to induce the workman to settle the case without consulting them.

After recording these facts, the judge said that even if he assumed that the particular complaints and allegations made were well founded he was unable to see how the presence of the workman's solicitor would be a more efficient protection than that of his medical man. Whatever the solicitor could properly do the medical man could at least do equally well; he could interfere if necessary during the examination, and he could observe (far more intelligently than a solicitor) what was being done and the workman's conduct, and make a note of what was said and what passed. No instance had been given of a medical man having failed to do what a solicitor could have done if he had been present; in all the cases relied upon no medical man had been present on behalf of the workman. Another medical man called on behalf of the claimant had said that if a doctor was present there was no necessity for a lawyer to be present, and that in his opinion the patient's doctor should always be present. The plaintiff's solicitors had also said, in answer to a question as to why they insisted on being present, that they wished to prevent improper questions being put or answered, and improper advice being given, and to take shorthand notes in order to check inaccuracies. The court was not convinced by that answer. It had also been suggested that the workman's medical man might be young and inexperienced or the workman might for some reason or another be unable to get him to attend; that might be so in a particular case: but the stipulation made in respect of the circumstances of the examination were not really based on any such narrow ground. They were really an attempt to bar out a particular examiner.

Continuing, the judge said that so far he had assumed that the charge of brutality and other allegations were well founded, but he was satisfied that this was not the case. There was no real foundation in his opinion for this charge of brutality. Dr. Collie had on several occasions expressed strong opinions upon the prevalence of malingering, and he might sometimes have mistakenly charged a man to his face with being a shammer or malingerer who in fact was not; such a man might not unnaturally perhaps resent the suggestion, and complain to his solicitor; but it was unfair and unreasonable to base upon this a serious charge of brutality. There was no objection in the court's opinion to the use of the battery as causing unnecessary pain. As to the other allegations, Dr. Collie's opinion might often be mistaken, and his recollection of what passed at an examination might be defective; but the court was satisfied that it was untrue that Dr. Collie had improperly examined a workman behind the solicitor's back or improperly tried to induce a workman to settle without consulting his solicitor. In the court's opinion, the offer by the defendants to conduct Dr. Collie's examination in the presence of the workman's doctor was a reasonable offer, and the solicitor's presence was quite unnecessary for the workman's protection.

But the court had also to consider what was a refusal under the Act. Was it a refusal if the man refused to be examined under the employer's conditions, these conditions being unobjectionable and reasonable, although he was willing to be examined under other conditions also unobjectionable and reasonable? If it was, then it followed from what the court had already said that in this case there was a refusal. But if the refusal was not a refusal so long as the claimant was willing to submit himself for examination under unobjectionable and reasonable conditions, then the court must determine whether the conditions required by the workman in the present case were in fact unobjectionable and reasonable. The court had been at first disposed to think that there could be no objection from the defendant's point of view to the examination taking place at the solicitor's office in the solicitor's presence, but Dr. Collie's evidence had satisfied it that the examination would probably be less effective and thorough if made under those conditions. Hence the court held that the conditions required by the workman were open to objection, and therefore, having regard to the conditions offered by the employer, were unreasonable.

The court added that it had also been contended for the workman that the case was analogous to that of a workman declining on his doctor's advice to undergo an operation, and that as this was not unreasonable, it should be held that the workman in the present case should be held to have acted reasonably in acting on his solicitor's advice. The court was of opinion, however, that the analogy alleged did not exist, and held that a workman could not excuse or protect himself by saying that he had acted on his solicitor's advice when that advice was mistaken.

Medical Referee not to Decide whether there has been an Accident or Not.

In a case at Dunfermline (August 5th) it appeared that an accident was alleged to have been sustained by a workman in December, 1909. A dispute having arisen as to (*a*) the extent of the injuries; (*b*) whether there was an accident or not, the employers agreed to refer the whole case to a medical referee. The workman refused to go to the medical referee until his employers admitted that there had been an accident. In the result the sheriff held that the workman was justified in so refusing, and mulcted the employers in the costs of abortive legal proceedings.

COMPENSATION FOR HERNIA.

A CORRESPONDENT asks what compensation a gardener ought to claim for an incipient hernia caused during his occupation. An insurance company offers him 30s. to settle.

*** The sum offered appears very trifling, but it would be impossible to suggest any equitable compensation from the data. The character of the hernia, the amount of disability

produced, and the nature of the man's occupation, would all have to be considered, and if the case came before a court of law there would probably be a great conflict of evidence on these points.

CONTRACT FOR ATTENDANCE IN CONFINEMENT.

A CORRESPONDENT writes that he was engaged to attend a lady in her confinement, and a little later was called in to the same patient, because her husband was ill-treating her. He has since received notice that his services will not be required at the confinement, and wishes to know whether he can claim the fee.

*** According to the principle laid down in *Hochster* v. *De La Tour* (22 L.J Q.B. 455), our correspondent might sue for his fee at once, and should succeed. The fact that the patient had engaged another practitioner, if proved, would show that the contract made with him had been definitely renounced. But medical practitioners have other things to consider besides their strict legal rights, and there might be circumstances which would make it wiser to waive the breach of contract.

LOCUMTENENTS AND FEES FOR MEDICAL EVIDENCE.

"LOCUMTENENT" writes that in a paragraph on the subject of inquest and *post-mortem* fees received by the locumtenent on behalf of the principal it was not mentioned that the *usual custom* was to share these fees between the two.

*** We have never heard of such a custom. There can be no more reason why these fees should be shared than any of the other proceeds of the practice during the time the locumtenent is in charge. It is not, however, unusual for the fees to be shared when the locumtenent is perhaps required to give evidence at an inquest the day after his engagement with the principal has terminated. Perhaps our correspondent is thinking of this.

ESTIMATION OF VALUE OF A PRACTICE.

SENEX JUNIOR asks the following questions: (1) Is the value of a partnership in a medical practice usually reckoned on the gross receipts, or on the net profits? (2) Should the half share of a practice be estimated on two years' purchase or on one and a half year's purchase?

*** (1) On the gross receipts. (2) This depends on the nature of the practice, and is a matter for agreement between the vendor and purchaser.

Medico-Ethical.

The advice given in this column for the assistance of members is based on medico-ethical principles generally recognized by the profession, but must not be taken as representing direct findings of the Central Ethical Committee, except when so stated.

THE MULTIPLICATION OF DOOR-PLATES AND THE TITLE OF "DR."

ISLE OF WIGHT.—We have many times condemned the practice of putting up door-plates where there is no bona fide tenancy. This is a matter which should be dealt with in the first instance by the local Division of the British Medical Association. The vexed question of the right of diplomates to call themselves "Dr." is not likely to be settled except by the greatly increased facilities now given to all English medical students to obtain university degrees. It is not probable that the Royal College of Physicians of London would deprive a Licentiate of his diploma for styling himself "Dr." on his door-plate.

MEDICAL PRACTITIONERS AND CLUBS.

NOVICE writes that he has recently started in practice, and he has reason to believe that the clubs in the district are not satisfied with their present medical men, and he has been unofficially advised to apply for the clubs. He wishes to know: (1) Whether it is usual for a medical man to apply for a post as club doctor; or (2) to wait till officially offered the post by the club.

*** (1) It is contrary to medical ethics and custom to apply for any post that at the time of the application is held by another practitioner. (2) It is usual to wait till the post is declared vacant by the proper authority, and applicants are invited to apply.

SUPERSESSION.

JUSTICE.—While the patient has undoubtedly the right to choose his medical adviser, it is a breach of etiquette for a medical man who is summoned in an emergency to a patient already under the care of another practitioner to assume possession of the case until the practitioner originally in charge has been informed shat his services are no longer required. The proper tribunal for dealing with such offences is the local Division of the British Medical Association.

Obituary.

WILLIAM THOMAS LAW, M.D.EDIN., F.R.C.S.ENG., BOURNEMOUTH.

IN Dr. William Thomas Law, whose death took place at Bournemouth last month, the medical profession has lost a member who was never happier than when lending a helping hand to a brother practitioner, or to any one needing aid and counsel. As such, and as a man of culture and many intellectual acquirements, his death must be a subject of general regret.

A son of the late Mr. Henry Compton Law of Allington, and born in 1845, he commenced the study of medicine as an articled pupil to the late Mr. S. S. Varcombe of Castle Cary, and later on entered Guy's Hospital. Mr. Varcombe being a Licentiate of the Society of Apothecaries, William Law, in virtue of a regulation existing at that time, was enabled as his apprentice to take the diploma of L.S.A. after a shorter period of hospital work than his fellows, and thus emerged from Guy's as a qualified man early in 1870. His contemporaries at the hospital included many men who, like himself, afterwards became well known. Among them were Golding-Bird, Jacobson, Mahomed, R. T. Pye-Smith, Arthur Cooper, Paramore, Connolly, Ewart, while a little senior to him were Alan Manby, George Eastes, F. Taylor, Goodhart, and F. Durham.

From Guy's, Law migrated to Edinburgh to go through the course for a degree, working first in the wards of the late Sir T. Grainger Stewart, and afterwards in those of Lister. At a later date he served as a Resident Physician in the Royal Infirmary for a year, first in Dr. D. Haldane's wards, and afterwards in those of Dr. G. W. Balfour, of cardiac pathology fame. Those were great days in Edinburgh, for though Goodsir, Syme, and Simpson had passed away, the glories of its school were safe with Lister, Christison, Hughes Bennett, Matthews Duncan, Laycock, Maclagan, P. H. Watson, Annandale, and Joseph Bell, to say nothing of pure scientists such as Turner, McKendrick, Crum Brown, Dewar, Allman, P. G. Tait, and others.

Law at this period had little idle time on his hands, for, besides continuous work in the wards, lectures in plenty, and class examinations, he had to get through four examinations for the M.B., and in Greek and Logic for the M.D., as well as three examinations in London for the diploma of the Royal College of Surgeons. At that time this college demanded a special preliminary examination for its Fellowship, comprising Greek, one modern language, and other extra subjects. Some of his examinations came very close together, as in April and May, 1871, when the First M.B., the Final M.R.C.S., and the Primary Fellowship were crowded into about five weeks. It was at this last examination that a noted anatomical conundrum was set and aroused much hostile comment; it required an exact description of the dissection required to expose from the outside the otic ganglion. As only four questions were set and all had to be adequately answered, there was apparently some ground for complaint.

These obstacles surmounted, Law was able to devote his attention to the duties of Resident Physician, which included the care of Dr. Matthews Duncan's gynaecological ward. Finally, having graduated M.B. in August, 1872, Law was appointed Assistant Medical Officer at the Chorlton Hospital, Manchester—then a large, newly created building on the pavilion plan—and remained there until he had taken the M.D. degree with "special distinction" for a thesis on mitral stenosis. Shortly afterwards he was appointed House-Physician at the Seamen's Hospital at Greenwich, where at that time the late Dr. Stephen Ward and Dr. C. H. Ralfe, of the London Hospital, were the

visiting physicians. The latter was then investigating scurvy, and a good deal of urinary analysis was carried out by Law in furtherance of these researches.

While at Greenwich Law passed the final examination for the Fellowship, and in 1876 sent in his name as a competitor for the post of Resident Medical Officer at the Brompton Consumption Hospital. The appointment—a very desirable one—was at that date filled by open competition from without, and the applicants were very numerous, but Law was appointed on the recommendation of the Medical Committee. A number of young house-physicians passed through the institution during his term of office, and in a letter concerning him one of them observes that Law's post called for tact as well as administrative skill, and that he filled it with great ability and success. "He had the saving grace of humour, and nobody who served the hospital at that time can have forgotten his cheery optimism and readiness to look on the lighter side of things in an atmosphere which was inevitably depressing, since the true nature and pathology of tuberculosis was not then understood and treatment was systematic and unprofitable."

After several years' work at Brompton Law became somewhat anaemic and was advised to live at St. Leonards. He was a firm believer in the value of open air in the treatment of consumption and before the Nordrach boom began in the English press treated patients on similar lines, publishing one such case treated in the early Eighties. His health having become re-established, he returned to London in 1885, and while waiting for patients occupied himself with clinical work at Soho Hospital for Women, the Skin Hospital, Blackfriars, after which he went to the Rotunda Hospital, Dublin. Subsequently he became interested in ophthalmology, and worked for a year at Westminster Ophthalmic Hospital.

He also visited Professor Landolt's clinic in Paris, and in conjunction with that ophthalmologist translated some of his French and German papers on the subject of convergence, one of them was published in the *Ophthalmic Review*. Until 1895 he lived in Norfolk Crescent, Hyde Park, but after that date he, for family reasons, spent a good deal of time in the country, and also for a short time was in Bury St. Edmunds and Northwood; he retained, however, his consulting rooms in Weymouth Street, and did not attempt local practice.

In 1902 Law became the central figure in what was at the time something of a medical *cause célèbre;* he was made defendant in an action of the "heads I win, tails you lose" order, huge damages being claimed by a morphine patient. After four days' hearing the jury stopped the case, saying the action ought never to have been brought, while the judge expressed his opinion of the manner in which the case had been got up in terms which those who were present will not readily forget. As is too often the case, Law, though awarded costs, was unable to obtain them, and thus suffered heavy financial loss. Under the auspices, however, of Dr. Richard Paramore, who gave much of his time, thought, and energy to the matter, a handsome sum was subscribed by the profession and was presented to Dr. Law on behalf of the donors by the President of the College of Physicians, Sir William Church, at a public meeting of sympathisers.

A few years later there was a still more trying incident in Dr. Law's life; his only son, a promising Cambridge graduate of 25, died of typhoid fever. This event left him childless, and seemed immediately to light up a chronic appendicular trouble. It was successfully removed by an operation at the hands of Sir Watson Cheyne, but Law was never again quite the same man. He had long been subject to attacks of biliary colic, and it was a few days after an operation undertaken for that condition that his life ended. Law, who at that time had been living for about a year at Bournemouth, seems to have had a premonition that he had run his course. He died on September 6th, and was buried near his son at Ripley, his Surrey home. He is survived by his wife, a daughter of the late Mr. Price, Q.C., Recorder of York and County Court Judge for West Norfolk.

In a letter respecting Dr. William Law, a correspondent other than the one whose communication has been mentioned, aptly quotes the words:

> A life well spent! Whose early care it was
> His riper years should not upbraid his green!

He adds that Law ever showed himself interested in good causes, and not only those of a purely professional kind, but in any of a social and philanthropic nature. Though naturally delicate, Law, he continues, by avoiding all things doubtful which trip up so many in the journey of life, was able to do much useful and solid work, and it is to be regretted that so amiable a man and so valuable a life should be lost to the profession.

CHARLES ALFRED SELBY DALGLIESH, M.D.,

SUNDERLAND.

We regret to announce the death of Dr. Charles Alfred Selby Dalgliesh, which took place at Sunderland on August 27th after a short illness. About a week before his death he contracted a chill, which developed into pneumonia, and he died from cardiac failure.

Dr. Dalgliesh was the son of Dr. Jonathan Dalgliesh of Newcastle-on-Tyne. After leaving school he studied medicine at Newcastle, and took the degrees of M.B., C.M. of Durham University in 1890. Two years later he obtained the degree of M.D. After graduating he held the posts of Junior and Senior House-Surgeon at the General Infirmary, Leeds, and later was appointed Resident Medical Officer to the Radcliffe Infirmary, Oxford. He was also for some time House-Surgeon at the Ophthalmic Hospital of the same city. Desirous of travel, he took a voyage to India as ship surgeon on a P. and O. liner. When the war broke out between China and Japan he acted as surgeon on board H.M.S. *Victoria* when the latter vessel was cruising in Chinese waters for the purpose of safeguarding British interests. During the Boer war he had charge of troops going to South Africa, and was surgeon on board the vessel which brought Dr. Jameson to this country. On his return to England in 1899 he was appointed House-Surgeon to the Sunderland and Durham County Eye Infirmary, which post he continued to hold until 1909, when he was appointed Honorary Surgeon to the institution. He then commenced practice as an eye specialist. In that branch of practice he was acquiring a wide reputation, and his undoubted ability and clinical knowledge promised to place him in the front rank of authorities on diseases of the eye. His opinion was much sought after, and his loss will be keenly felt by his brother practitioners. His services were frequently in request in connexion with medico-legal matters. Of a modest and retiring disposition, he was respected by all who knew him, and by those who were privileged to know him intimately his friendship was held in the highest esteem. He was married so recently as November last year, and much sympathy is felt for his widow in her sad bereavement.

MATTHEW B. MACKENZIE, B.A., M.D., R.U.I., L.R.C.S.I.,

MEDICAL OFFICER, LISBURN UNION HOSPITAL AND INFIRMARY; CONSULTING MEDICAL OFFICER OF HEALTH TO THE LISBURN UNION.

It was with much regret that the profession and the public heard of the sudden death of this well-known and much-respected practitioner, which took place on September 13th at Lisburn.

On that date Dr. Mackenzie had been paying his daily visit to the infirmary, but evidently did not feel well; he returned home, and, going to his consulting-room, lay down on the couch, saying that a rest would soon make him all right. But the symptoms rapidly became alarming, and his near neighbour, Dr. St. George, was hurriedly summoned; however, Dr. Mackenzie died a few minutes after the latter's arrival, evidently from apoplexy.

Dr. Mackenzie had been in practice in Lisburn for nearly forty years. On starting, he soon made hosts of friends and gained several appointments. He was a diligent and painstaking officer, and was instrumental in bringing about the enactment of several measures for the improvement of the condition and brightening the lives of the inmates of the infirmary. For several years he took a prominent part in municipal affairs, and was a member of the old Board of Town Commissioners. A pathetic interest is added to his death by the fact that a very sub-

stantial testimonial was being widely supported, and was to have been presented to him at an early date.

He was a widower, and leaves two sons and two brothers, with all of whom much sympathy is felt. One of the brothers is Dr. W. G. Mackenzie, of Belfast.

THE LATE DR. LOMBE ATTHILL.

The following particulars of the ancestry of Dr. Lombe Atthill, kindly supplied by his son, the Rev. William Atthill, form an interesting supplement to the obituary of the distinguished obstetrician which was published in the Journal of September 24th.

Dr. Lombe Atthill's father, the Rev. William Atthill, was an only son and orphan, and was possessed of the estate and residence of Brandiston Hall, Norfolk, held by his ancestors for centuries. He went to Ireland, after his ordination by the Bishop of Lincoln of the day, as Chaplain to his relative, Dr. Porter, who had been appointed Bishop of Clogher. Dr. Lombe Atthill's mother was Henrietta Eyre, daughter of Dr. Maunsell, Dean of Leighlin, whose wife was sister to the first Countess of Bantry. Dr. Lombe Atthill's grandfather, the Rev. William Atthill, is buried at Brandiston, where also lies his wife. Dr. Lombe Atthill's eldest brother, the Rev. W. Atthill, who succeeded to the estate, are also buried at Brandiston, and several other members of the family. Dr. Atthill's Christian name, Lombe, is really a surname. He was called after the Lombes of Bylangh Park, Norfolk. An ancestor, Sir Anthony Lombe, married an Atthill. Anthony is a common name in the family. The Lombes still own Bylangh Park, a large landed estate in Norfolk. It is a fine mansion, let, we believe, to an American millionaire named D'Arcy.

The following appreciations, which by the courtesy of the Rev. William Atthill we are allowed to publish, will help to show something of the regard in which Dr. Lombe Atthill was held by those who had the best opportunities of knowing him:

Dr. Walter C. Swayne (Clifton), after expressing the grief with which he had heard the news of Dr. Lombe Atthill's sudden death, writes to the Rev. William Atthill: "Your father's wide experience and freshness of mind will be much missed by the profession. He always struck me as one of the most valuable types of medical man one can meet with, namely, one of age and enormous experience who was at the same time quite without that conservatism which looks askance at all advances as new-fangled notions, and often refuses to examine modern methods by the light of past experience. I have never met a man of his age and experience who was better able to give reasoned attention to new methods or more willing to examine them. That, however, is the necessary mental qualification of the pioneer, but he, unlike many of that class, did not lose his adaptability of mind with advancing age. I think I may say that I personally received more encouragement and support from talking to him and hearing his views than from any one I know, quite apart from his charming personality and broadminded views on medical matters and life generally. I hope you will allow me to say that I feel I have sustained a personal loss, and that every member of the profession with whom he came in contact will feel the same."

Miss S. E. Hampson, sister of Sir Robert Hampson, Mayor of Liverpool from 1903 to 1904, for many years matron of the Rotunda Hospital, writes: "I am more sorry than I can say at the loss of one who was such a kind friend to me when I first came to the Rotunda Hospital, and ever since. I am sure you know, without me saying, how keenly I appreciated the honour of his friendship, of his help, and his advice; and that I always realized how great a measure of my success was owing to the deep interest he took in my work of reorganizing the nursing and housekeeping departments. My sorrow for the passing of your distinguished and eminent father is very deep and sincere."

Deaths in the Profession Abroad.—Among the members of the medical profession in foreign countries who have recently died are Dr. Farabeuf, formerly Professor of Anatomy in the Paris Medical Faculty and Member of the Académie de Médecine; Dr. Leopold Oser, Extraordinary Professor of Clinical Medicine in the University of Vienna, Physician in Chief to the Rothschild Hospital, in his 71st year; Dr. Sigmund Mayer, Professor of Physiology in the German University of Prague, aged 67; Professor Hermann Schwartze of Halle, one of the pioneers of scientific otology, aged 73; Dr. S. Nagayo of Tokio, President of the Japanese Society for the Study of Gastro-enteric Diseases, and director of an institution for the treatment of diseases of the stomach; Dr. James Nevins Hyde of Chicago, one of the leading dermatologists of America, aged 70; and Dr. Emily Blackwell, a sister of the late Dr. Elizabeth Blackwell, in conjunction with whom she founded the New York Infirmary for Women and Children, aged 84.

Medical News.

The formal opening of the winter session at the West London Post-Graduate College, on October 10th, will be marked by the delivery, by Dr. Basil Hood, of an address on specialism in medicine.

The Child Study Society (London) announces a series of lectures and discussions on the Recreational Activities of Children, from October to December, 1910, at the Royal Sanitary Institute, 90, Buckingham Palace Road, S.W. The honorary secretary is Mr. W. J. Durrie Mulford.

On the occasion of the first winter meeting of the North-East London Clinical Society an address is to be delivered by Dr. Frederick Taylor on the diagnosis of prolonged pyrexia. The meeting takes place at 4.15 p.m. on October 13th at the Prince of Wales's Hospital, Tottenham.

The autumn meeting of the South-Eastern Division of the Medico-Psychological Association will be held by the courtesy of Dr. T. E. K. Stansfield at the London County Asylum, Bexley, on Wednesday, October 5th, 1910. A communication on heredity and insanity will be presented by Dr. T. E. K. Stansfield, and one on sterilization of the insane by Dr. E. Faulks.

The *London Gazette* of September 23rd announces the following further appointments in Queen Alexandra's household: Sir Francis Henry Laking, Bart., G.C.V.O., K.C.B., to be Physician in Ordinary and Surgeon Apothecary to the Household; Sir Frederick Treves, Bart., G.C.V.O., C.B., to be Surgeon in Ordinary; Sir Alan Reeve Manby, to be Physician Extraordinary and Surgeon Apothecary at Sandringham; Milsom Rees, Esq., F.R.C.S.Edin., to be Laryngologist.

The usual Monthly Meeting of the Executive Committee of the Medical Sickness, Annuity, and Life Assurance Society was held at 429, Strand, London, W.C., on September 16th, at 4.45, Dr. de Havilland Hall in the chair. The accounts presented showed that the sickness experience of the society during the summer months had been as usual well under the expectation, and this, combined with the moderate claim list of the early months of this year, has produced a good margin in favour of the society. In the later months of the year a larger number of sick claims must be expected. A large number of the members have reached the age when the effects of exposure to hard weather are apt to compel a cessation from work; but it is a very satisfactory feature of the experience of the society that the number of sickness claims of the kind has been less than was anticipated. The claims in winter are always more numerous than those in summer, but the difference is not as great as the large proportion of the members who have passed mid age might lead us to expect. The financial condition of the business is most satisfactory. Although the amount paid away in sickness claims necessarily increases with the number and average age of the members, and in addition a substantial cash bonus is paid to all members reaching age 65, yet the funds are steadily growing, and now amount to over £240,000. Prospectuses and all information on application to Mr. F. Addiscott, Secretary, Medical Sickness and Accident Society, 33, Chancery Lane, London, W.C.

Letters, Notes, and Answers.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

MER writes: I would be glad to have the names of a few drugs that have the best reputation for the treatment of sea sickness.

OMEGA asks for information as to the absence of fogs and the longest record of clear atmosphere in English coast towns.

BAHIA would be glad to know what are the results of prostatectomy, namely, the percentage of cures, unsatisfactory results, and mortality; also if any correspondents can suggest any other good method of draining the bladder in cases where the prostate and urethra are tender and resent the passage even of a soft catheter.

LICENCE DUTY ON MOTOR CARS.

W. A. H. states that he possesses a 12-h.p. Humber, which according to the Government measurement is rated as 19.6-h.p., with the result that instead of benefiting by the concession to medical men in regard to licence duty he finds his duty increased. He inquires whether anything can be done in the matter.

*** Under the Finance Act for 1909–10 the unit of horse power for the purpose of licence duty is required to be calculated in accordance with the regulations made by the Treasury, and against those regulations there is no appeal. There is, of course, a very considerable increase in the duty on motor cars under the Finance Act, but the increase has been greatly tempered to medical men by the rebate of one half the duty.

ANSWERS.

DR. JOHN E. GARNER (Preston) writes to advise "Aphorism" (BRITISH MEDICAL JOURNAL, September 10th) to purchase a small publication written by C. Mansell Moullin, M.D.Oxon., F.R.C.S., in 1900, *On When to Operate in Cases of Inflammation of the Appendix* (London Publishing Company, Ltd., *Clinical Journal* Office, 2½, Bartholomew Close, E.C.) All the necessary information required would be obtained from that work.

FLEAS AND FLIES.

DR. ARTHUR HAYDON (London) writes, in reply to "M.D.": I would suggest that a piece of cotton wool impregnated with carbolic acid be kept in the pocket of the pyjamas.

IMMUNISER writes: "M.D." has evidently impaired resisting powers to these insects. May I suggest that he have estimations made of his opsonic index to "*Pulex*" and then try vaccine therapy? Probably an initial dose of one thousand (*dead*) might be of service.

F.R.C.S.E. (Liverpool) writes: I should recommend "M.D." to use a well-known and simple method which I learnt while doing dispensary work. Pour a few drops of chloroform down the sleeve immediately after being in contact with a dirty case. Also, when the insects bite, press the clothes against the body and drop on a little chloroform. It is safer to shake out the flea lest it be only anaesthetized.

DR. FOSTER OWEN (London) writes: In reply to your two correspondents in the BRITISH MEDICAL JOURNAL of September 24th on fleas and flies, I can give an opinion and a partial advice on these questions which are worthy of trial. I am amongst these pests continually, but they do not give me much trouble. Of one thing I am convinced, that the great cause of the immense armies of flies in the poor rooms is the fact that the people will not keep their windows open, and the fly, as we know, hates a draught and never thrives in the current of air, which would be the case if they kept their windows well open continuously. This I have noticed and proved to my satisfaction as the main cause of their infesting the rooms of the poor, which are generally stuffy and close, warm, and smelling, which are just the conditions to favour these pests. In addition, it has often been proved satisfactorily that ol. thymi vulgaris, used as a spray about the room, or even ol. eucalypti in the same way. But the main enemy to the fly is open windows and good draughts, and carbolic or sodium hyposulphitis in the wash for the ceilings and walls. And in the question of the fleas, which I see very frequently by the hundreds, the prescription for making acetum cevadillae combined with the oil of thyme, as spray or lotion, will, I think, prove satisfactory.

LETTERS, NOTES, ETC.

ST. PAUL'S THORN IN THE FLESH.

DR. F. D. WELCH (London) writes: Will a supporter of the defective eyesight theory answer this question? If "plucked out your own eyes" is to be taken literally, why should not "I bear in my body the marks of the Lord Jesus" (Galatians, vi, 17) be taken literally to mean that St. Paul had holes in both hands and both feet and a spear wound between his ribs (see St. John's Gospel, xix)? It is, to my mind, ridiculous to interpret these passages in Galatians literally. Will Dr. George Jones say on what evidence he makes the statement that St. Paul added the last lines "in a large hand similar to that used by some myopes" (BRITISH MEDICAL JOURNAL, September 17th)? I have not time at present to search carefully all the Epistles; but what evidence is there that some one else wrote Galatians, and St. Paul only added with his own hand the verse, "Ye see with how large letters," etc. (chap. vi, 11)? This statement occurs *in the middle of chap. 6, followed by six verses of argument, and the final salutation.* This statement in Galatians is quite different from 2 Thessalonians, iii, 17, "the salutation of Paul with mine own hand . . . so I write," which occurs *at the end* of the chapter. There is also in 2 Thessalonians *no statement about large handwriting* either just before or after the salutation; neither is there in 1 Corinthians, Romans, Philippians, Colossians, and in these also the salutation is *at the end* of the epistle. These points seem to me strong evidence that the words "with how large letters" mean what I have stated, and that St. Paul wrote the *whole* of Galatians with his own hand. It is many months since I read all the Epistles through, but I do not remember ever noticing the words "with how large letters" in any epistle except Galatians. My memory may have failed me, however, on this point, and possibly some reader may correct it. It was of the greatest importance that every word in Galatians should be quite distinct, and there should be no correction, and if St. Paul's eyesight had been so defective that it was always necessary to write in large letters, he would never have attempted to write the last seven verses himself, but would certainly have entrusted it to some one with good eyesight. *I do not believe or wish to suggest that St. Paul had epileptic or other fits as well as the headaches.* Dr. George Jones seems to be of the opinion that it is quite impossible to get very severe headaches in a non-fatal case recurring at intervals, as I suggested. I have met with several such cases, some following concussion of the brain. A comparison of the first part of 2 Corinthians, xii, with Acts, xiv, shows that St. Paul was thinking of what had happened on his missionary journey with St. Barnabas (Acts, xiv, 8–18). St. Barnabas is the man referred to as "caught up to the third heaven" and "into paradise." St. Paul healed the cripple at Lystra (recorded immediately before the stoning, I would point out), and the people fell into error and named "Barnabas Jupiter and Paul Mercurius." Lest the readers of 2 Corinthians should fall into a similar error he would not tell them details of his own revelations, but goes on to the "thorn in the flesh." In all the cases of the severe headaches I have met the patients, men and women the mothers of families, said they were the worst pains they had ever had, and one woman attempted suicide because she dreaded their return. Such headaches would be the best way to prevent St. Paul being "exalted above measure." Now Satan's strongest attacks on a believer's faith in Christ are when bodily pain is either present or likely to come in the near future, and before Christ rose from the dead the faith of His gallant soldier, St. Peter, failed for a time at the thoughts of his own crucifixion. St. Paul thought his own faith in Christ might fail for a time if these headaches continued, and so on the three occasions prayed for them to depart. Christ's reply, "My strength is made perfect in weakness," meant that resisting temptation during bodily pain and weakness would strengthen faith in Christ, and repeated resistance would make that faith perfect. Hearing this St. Paul gloried in these headaches.

BRUSSELS INTERNATIONAL EXHIBITION.

THE products of Messrs. Burroughs Wellcome and Co. have been awarded eight Grands Prix, three diplomas of honour, and one gold medal at the Brussels International Exhibition. Messrs. Edward Cook and Co., Limited (London), were awarded the Grands Prix in the Class of Applied Chemistry and Pharmacy and in that of Perfumery; in the Class of Hygiene they were awarded a diploma of honour. The Grand Prix of the Brussels Exhibition has been awarded to Apollinaris. Messrs. Liebig's Extract of Meat Company, Ltd., have been awarded three Grands Prix for Oxo and Lemco. The ceremony of distributing the prizes has been fixed for October 18th.

THE SOCIETY OF APOTHECARIES OF LONDON.

IN one of the references to the Society of Apothecaries of London in the recent Educational Number, the word "royal" was accidentally prefixed to its title. The society possesses a royal charter, but technically is not entitled to use the word "royal."

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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Eight lines and under	0	4	0
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A whole column	2	13	4
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An average line contains six words.

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Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Wednesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste Restante* letters addressed either in initials or numbers.